



**Interview**  
Ilya Nedyal



**The Gallery**  
Adam Skutt, Ali Chenari,  
Yimin Zhang & more!



**Project Overview**  
"Judge Death"  
by Petr Nasirov



**FREE - Inside Look!**  
Digital Art Masters:  
Volume 4 Project Overview  
by Weiye Yin

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# STYLIZED CHARACTERS

NEW TUTORIAL SERIES STARTING WITH TOON ANIMALS

## Sculpting a Female Character

This month **Wayne Robson** sculpts an obese woman in the second part in our **Mudbox Female Character Creation** tutorial series.

## Rig Creation

Chapter three of our **Introduction to Rigging** tutorial series for 3dsmax & Maya will show how to create the rig for your character.

## NEW!! Indoor Environment Lighting: Sunset / Sunrise

Moving indoors **Viktor Fretyán, Jamie cardoso, Luciano lurino** and **Fredi Voss** will kick start this all new Environment Lighting tutorial series.



## EDITORIAL

Hello everybody and welcome to the **58th issue** of 3DCreative magazine. This month we are very excited to launch 3DCreative in a great new format that offers an abundance of new features that we hope you all enjoy. Among the new features are video's that can be viewed directly on the page and an

easy to use interface that makes page navigation much easier and smoother. We are always trying to improve 3DCreative magazine so get in touch with me at [simon@3dtotall.com](mailto:simon@3dtotall.com) to let me know what you think.

As if this wasn't enough to get excited about, we have some new tutorials for you this month including an amazing new environment lighting series. The last issue featured the last chapter in our outdoor lighting series and this month we move on to an indoor scene. This series will be concentrating on the way natural and artificial light can be created for an amazing indoor scene that was created for us by **Viktor Fretyán**. For this new series we invite back some familiar faces and warmly welcome some great new artists. The series will be handled in four different pieces of software, **Viktor Fretyán** will be using 3DS Max and V-Ray, **Jamie Cardoso** 3DS Max and Mental ray, **Luciano Iurino** Maya and Mental Ray and **Fredi Voss** will be using Cinema 4D.

Our second new tutorial series starting this month is How to Stylize and Model Toon animals and People. The series starts by looking at creating a cartoon animal with **Jose Alves da Silva**. Jose shows us in great detail how he makes his superb boxing kangaroo and this month talks us through the concept and modeling stages. If you are interested in creating cartoon animals this tutorial is a must!

If rigging and animation is more of your thing you will be pleased to hear that this month we continue our rigging series by **Richard Kazuo** and **Danilo Pinheiro** in Maya and **Luis San Juan Pallares** for 3DS Max. This month also see's the next instalment of Female Character Creation tutorials by **Wayne Robson**. This month Wayne talks us through creating the head of an obese lady in a classical style. Make sure you keep your eyes out for the excellent video's that Wayne has prepared to show how to create parts of the sculpt, this month they appear directly in the text as we make the most of the new magazine format.



## CONTENTS

What's in this month?



## ILYA NEDYAL

Self-taught 3d artist



## THE GALLERY

10 of the Best 3D Artworks



## NEW!! STYLIZED TOON ANIMAL

Chapter 1: Concept and Modeling



## MUDBOX FEMALE

Character Creation Chapter 2: Obese



## INTRODUCTION TO RIGGING

Chapter 3: Rig Creation - Part 1



## "JUDGE DEATH"

Project Overview by Petr Nasirov



## "FLY TOGETHER"

Digital Art Masters: Volume 4 – Free Chapter



## NEW!! INDOOR LIGHTING

Series for 3ds Max MR & V-Ray, Maya & Cinema 4D



## ABOUT US

3DTotall.com Ltd Information & Contacts

## EDITOR

Simon Morse

## LAYOUT

Layla Khani

## CONTENT

Simon Morse

## PROOFING

Jo Hargreaves

## LEAD

DESIGNER

Chris Perrins

## MARKETING

Claire Hughes

Richard Tilbury

Chris Perrins

Tom Greenway

Richard Tilbury

Chris Perrins

Richard Tilbury

## CONTRIBUTING ARTISTS

Every month artists from around the world contribute to 3DCreative, and you can find out a little more about them right here! If you'd like to get involved in 3DCreative magazine, please contact: [simon@3dtotal.com](mailto:simon@3dtotal.com)

## ENVIRONMENT LIGHTING INDOOR SCENE

Chapter 1 of our new Environment Indoor Lighting tutorial series with a great lineup of talented artists:

**Jamie cardoso** (3ds Max + MR), **Viktor Fretyán** (3ds Max + Vray), **Luciano Iurino** (Maya) and **Fredi Voss** (Cinema 4D).



### VIKTOR FRETYAN

Viktor Fretyan is an architect working on his diploma project whilst working as a freelancer. Viktor is doing mostly architectural renders and has never really tried out at any other fields of 3d yet. Viktor also has a passion for movies and maybe at some point will try working on VFX.



<http://radicjoe.cgsociety.org/gallery/>  
[radicjoe@yahoo.com](mailto:radicjoe@yahoo.com)



### LUCIANO IURINO

Started back in 1994 with 3d Studio on MSDos as a modeller/texture artist. In 2001 he co-founded PM Studios (an Italian videogame developer) with some friends, and still works for it as the lead 3D artist. He also works as a freelancer for different magazines, web-portals, GFX and videogame companies, and recently he left the 3ds Max environment to move on to XSI.

<http://www.pnstudios.it> | [iuri@pmstudios.it](mailto:iuri@pmstudios.it)

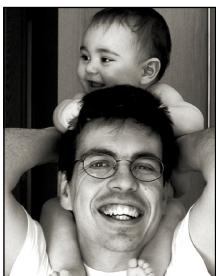


### FREDI VOSS

Living and working as a fine artist and 3D freelancer in Germany, Fredi – a.k.a. rollmops – can often be found on the various web communities, where he has also won several awards. His client list includes Audi and Siemens, and he also has an Animago Award and a Fine Art degree under his belt!



<http://fredivoss.cgsociety.org/gallery/>  
[vuuxx@gmx.de](mailto:vuuxx@gmx.de)

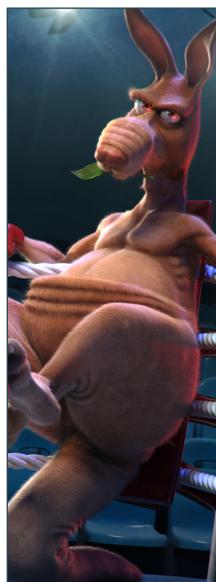


### JOSE ALVES DA SILVA

Jose Alves da Silva has been working in the 3D field for over 15 years. Jose started working mainly in Architectural

visualization. Jose works as a full time freelancer dedicated to character creation and illustration. This has given Jose the opportunity to work on some spectacular projects in the feature film, advertising and gaming industries.

<http://josealvessilva.daportfolio.com/>  
[joalvessilva@netcabo.pt](mailto:joalvessilva@netcabo.pt)



### WAYNE ROBSON

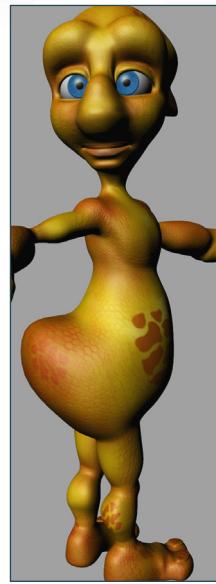
is a freelance digital artist who has taught Mudbox around the world and has been asked to lecture at the Vienna science academy. He is the programmer behind 'MudWalker' and the mental ray shader for vector displacement using Mudbox maps. currently he's works as a CGI supervisor for Project 2813. He owns Mudbox Hub and PsychoCore Software. [www.dashdotslash.net](http://www.dashdotslash.net)  
[wayne@dashdotslash.net](mailto:wayne@dashdotslash.net)



**DANILO PINHEIRO**

Danilo Pinheiro is a Brazilian with a Physics degree from UFMG. He worked for 5 years as a 3D generalist in films, advertising, arts, HQ, video clips, TV series, etc. After that, he is working as a Character TD, because he enjoys solving problems.

<http://nilouco.blogspot.com>  
nilouco@gmail.com

**LUIS SAN JUAN PALLARES**

My name is Luis San Juan, I am a freelancer with over 9 years CG experience. I have worked as a character setup supervisor and created tools for the studios I worked at, such as Nexus Productions, Keytoon Animation Studios, Ilion Animation Studios and the Mill.



<http://www.luis-sanjuan.com>  
luis@luis-sanjuan.com

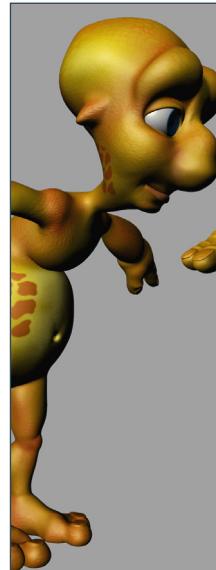
**PETR NASIROV**

Petr is a 24 years old character artist from Minsk, Belarus. Petr has been working in the game development industry

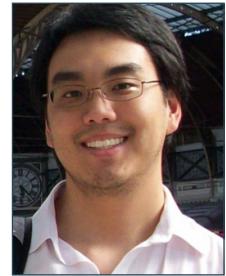
for more than 5 years. Currently Petr is a Lead Character Artist at the Steel Monkeys Company.

Petr started learning 3D at school and later his passion became his work. Petr learns something new with each character.

<http://www.5k3d.com>  
5k@tut.by

**RICHARD MAEGAKI**

Born in Brazil, Richard Maegaki studied at Melies School of Cinema and Animation where he discovered a passion for rigging.



After a brief time at Casablanca Animation as a Character Rigger, Richard was hired at Vetro Zero/Lobo and is working there as a Lead Character TD since 2007.

<http://riggerman.animationblogspot.com/>  
richardyo@gmail.com



Gallery Image | Ali Chenari

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“I LANDED MY FIRST JOB IN THE GAME INDUSTRY DOING CINEMATIC VEHICLE MODELS FOR GHOST RECON 2.”



il'ya ned'yal

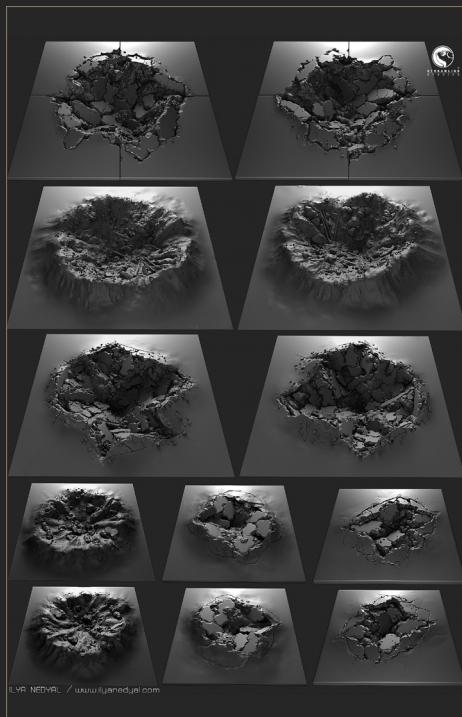


Having landed his first professional job and the young age of 17, self-taught 3d artist Ilya Nedyal takes time away from working on one of Crytek's future release to chat with us in our latest 3DCreative interview.

## INTERVIEW WITH ILYA NEDYAL

Hi Ilya, could you introduce yourself to our readers and tell us at what moment in your life did you start taking notice of 3D and realize that's what you wanted to do for a career?

Hello everybody, my name is Ilya Nedyal and currently I'm working as a freelance 3D artist. My passion for 3D started at a very early age, I was around 15 when I started doing models for GTA3 and UT2003. At the age of 17, I landed my first job in the game industry doing cinematic vehicle models for Ghost Recon 2.

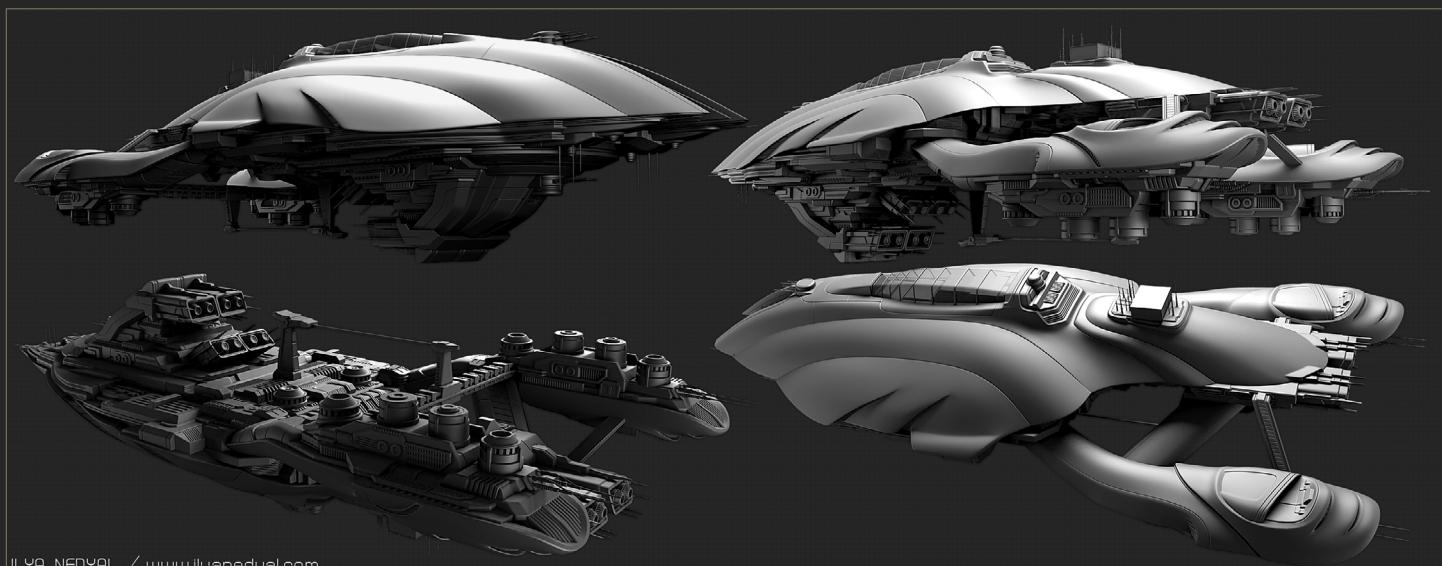


Wow that's very impressive to be working on such a big game at only the age of 17. What sort of training, schooling did you have to get you to that point?

I'm all self-taught :) I started reading books about 3Ds Max, I found it very very interesting at the time. So basically the books were my

starting point, and then I moved into models and more professional work.

Before becoming a freelance artist, you previously worked for Streamline Studios (which closed in 2009), as well as several other companies. Out of these which would you feel



has been, in terms of experience, the most beneficial to your development as an artist? In my experience, working for SLS has been the most beneficial. They were doing lots of next-gen props, and it's was back then when the entire "Next-Gen" thing happened for me.

Ok cool so what's been the most constructive piece of advice you've been given?

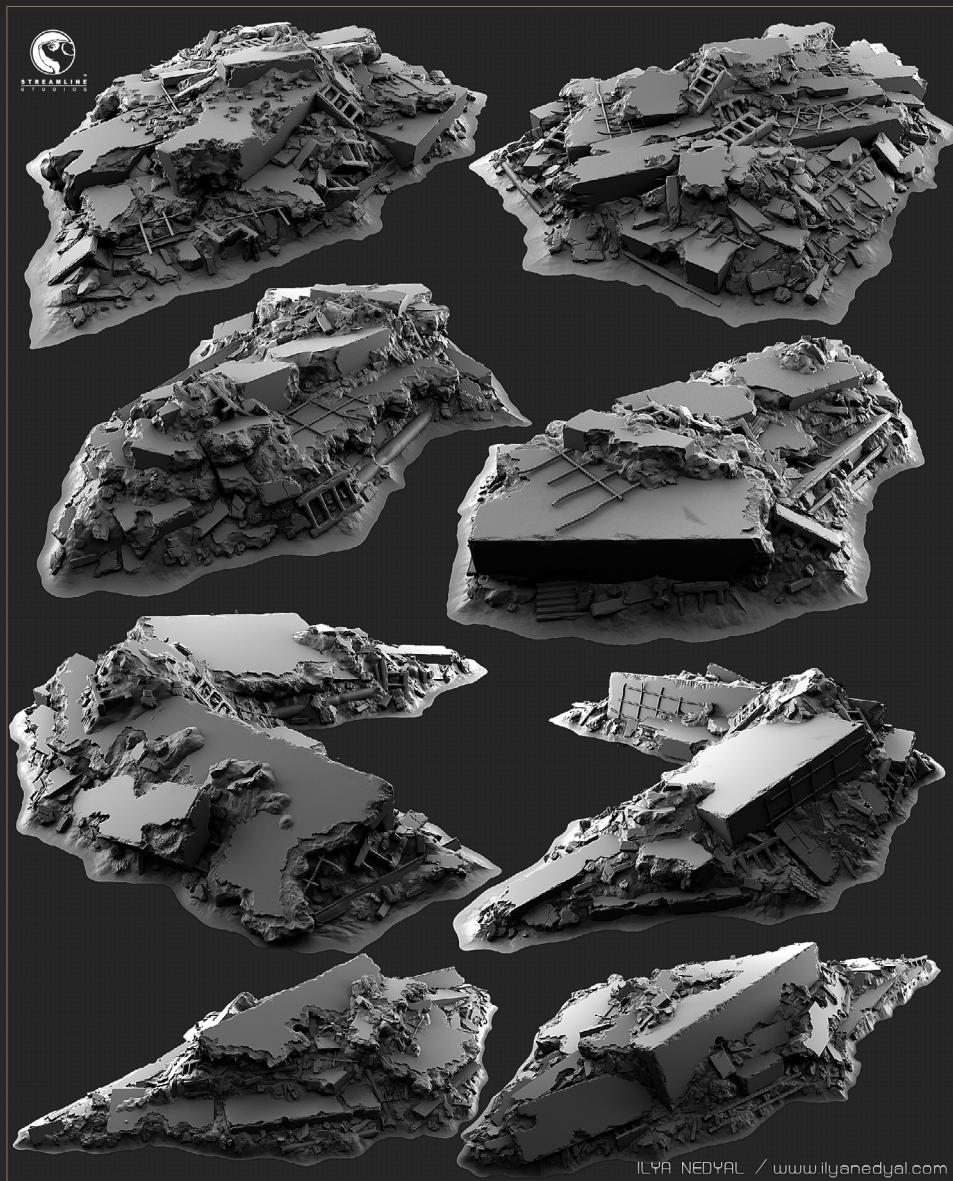
I don't remember any specific piece of advice, but with each new model, I'm learning something new and gaining experience.

Having several well know games titles under your belt, from the likes of Unreal Tournament, Terminator Salvation and Saints Row, which has been the most challenging?

The most challenging title was Unreal Tournament. It was the first project when I needed to make not only Low-poly models, but also a completely detailed Hi-poly model for normal map baking. It took me some time to figure it all out. But in the end it was a start up project for all the models I did after it.

If there was one project you could have worked on, what would it have been? And how would you have added your stamp to it?

If you would have asked me the same question a few months ago I would said working for

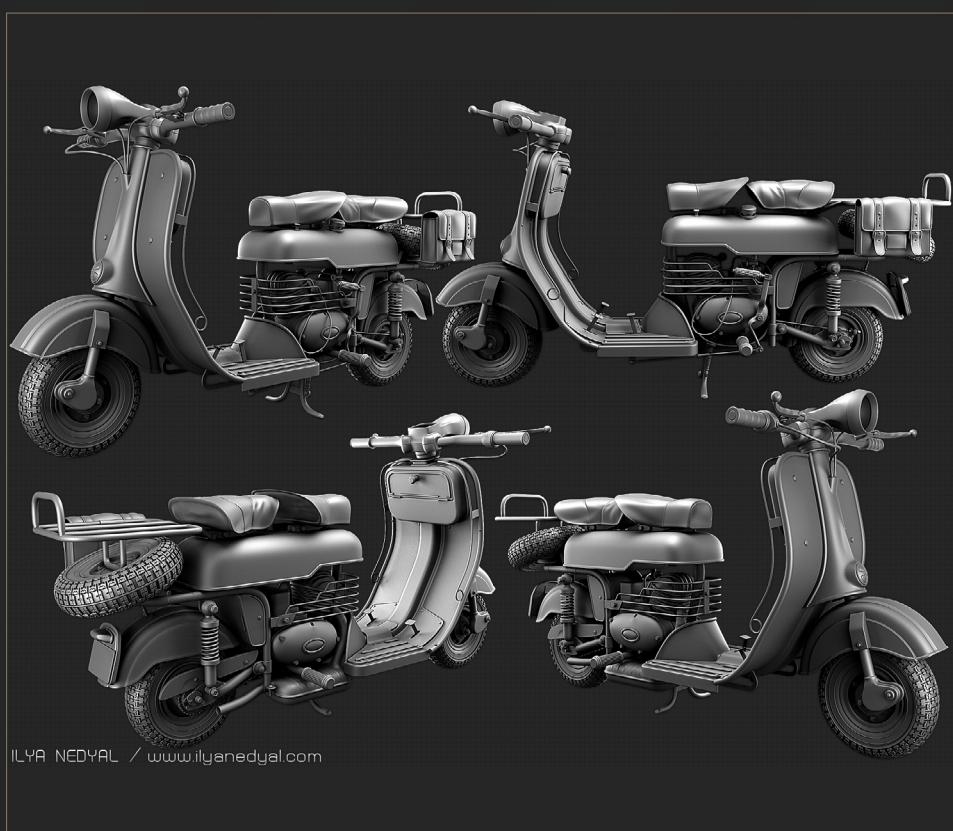
ILYA NEDYAL / [www.ilyanedyal.com](http://www.ilyanedyal.com)ILYA NEDYAL / [www.ilyanedyal.com](http://www.ilyanedyal.com)

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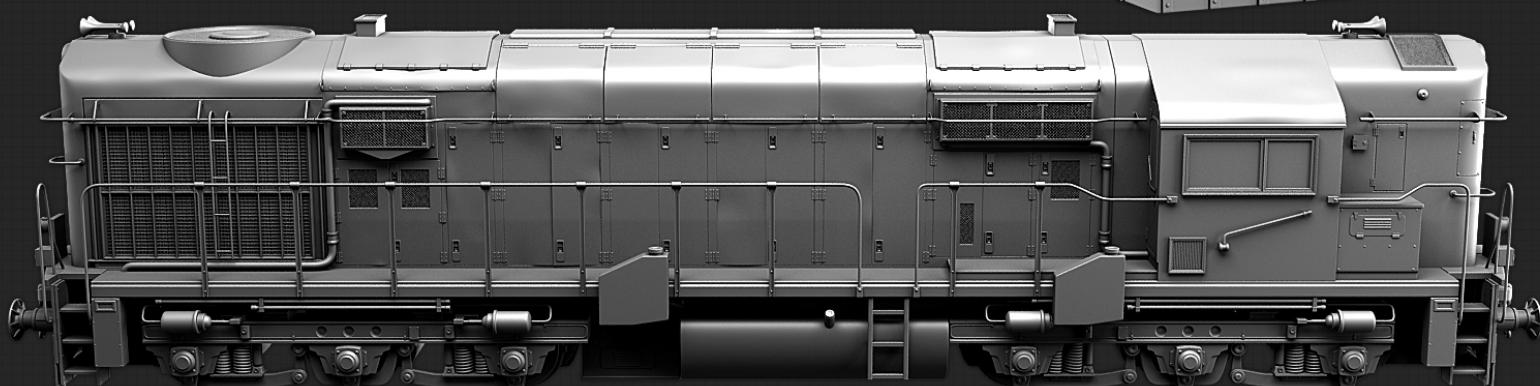
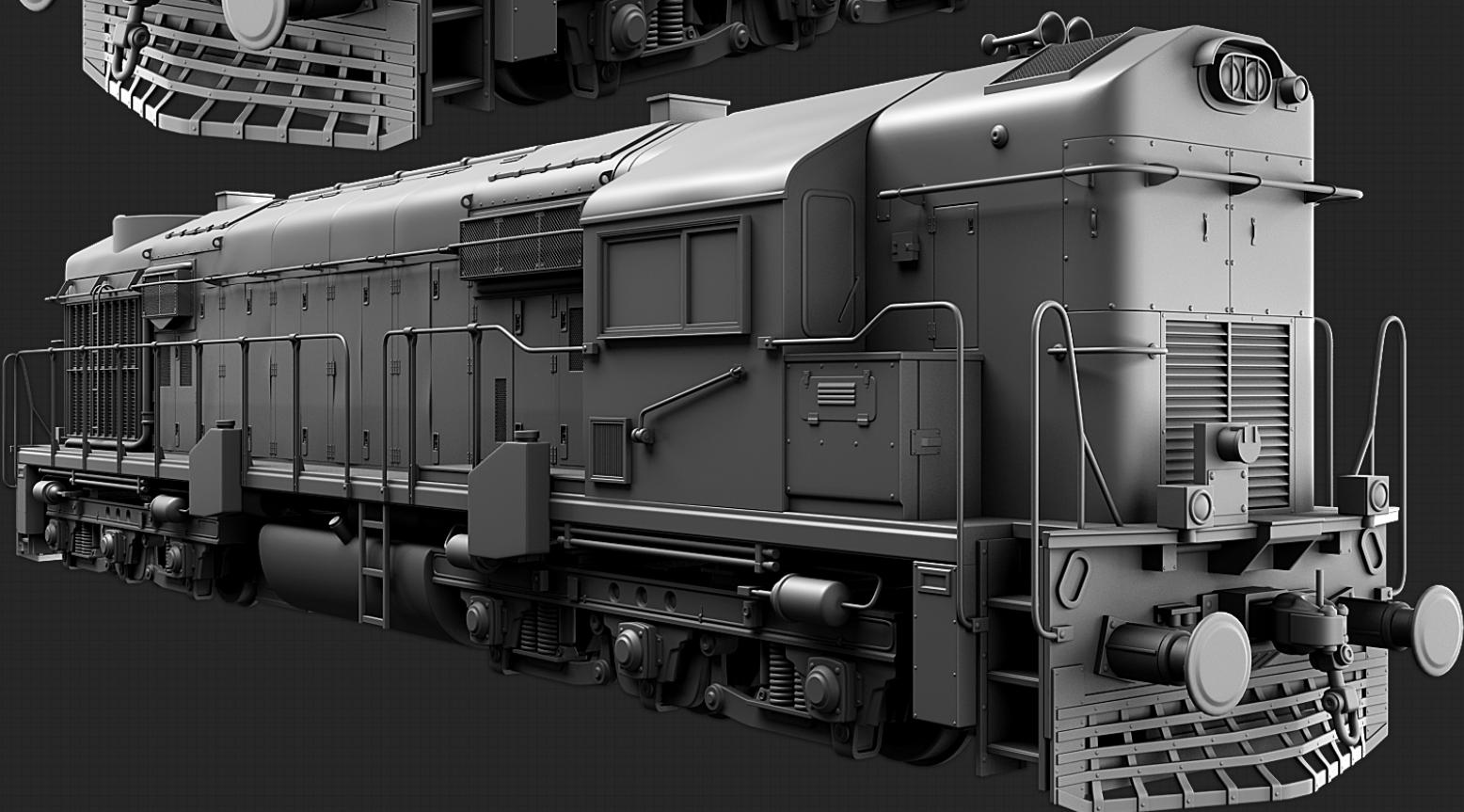
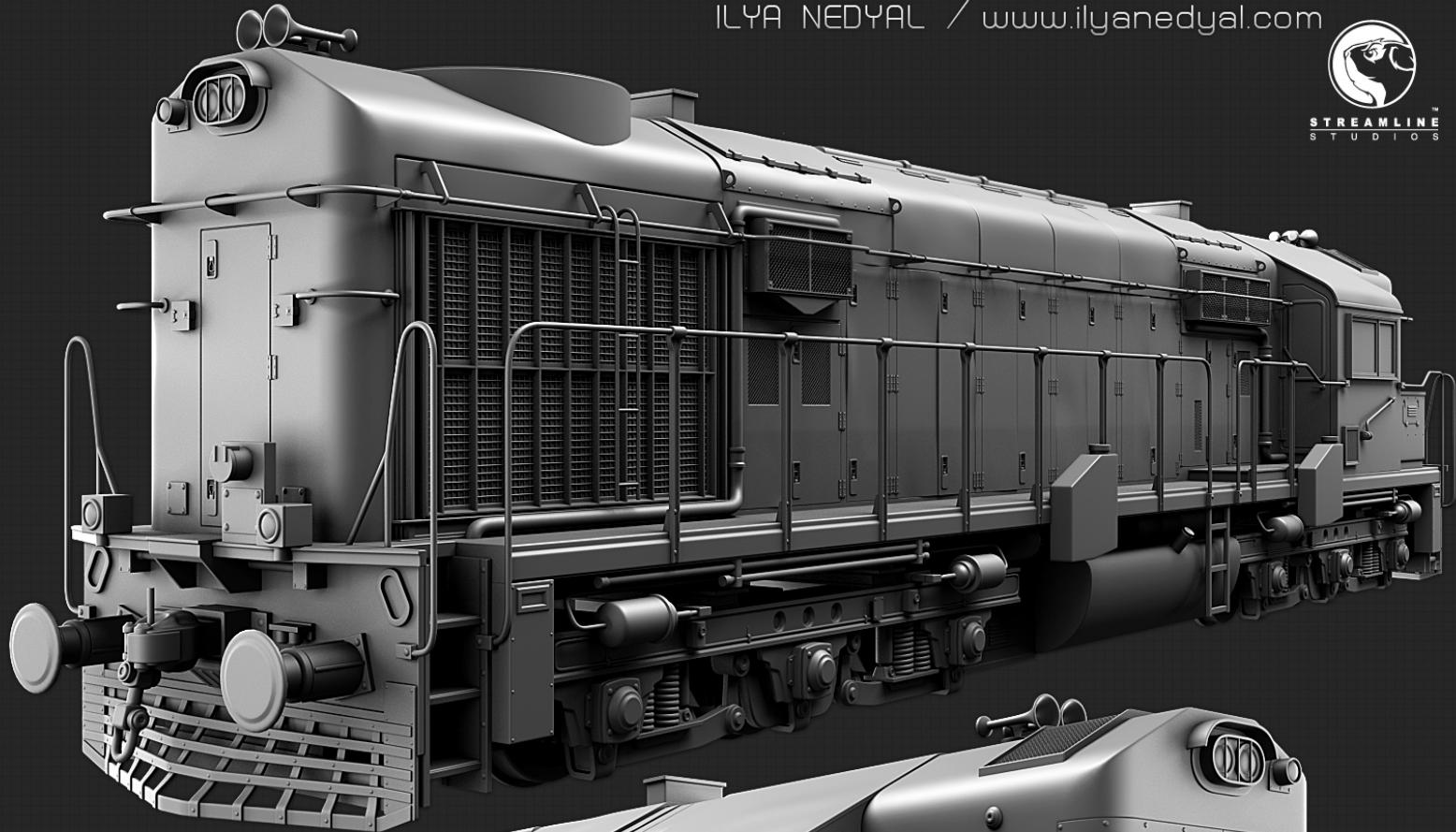
Crytek and working on their awesome looking games. But I'm already working for them so I would have to say a Metal Gear franchise. I really like their graphics style, and I think I could contribute to them with a few awesome vehicles or robots.

Over the many years I've been doing interviews I don't think I've seen so many incredibly detailed models in one person's portfolio as I have in yours. What kind of programs do you use in creating them and how long on average would you spend on a model?

I've spent a lot of time on my portfolio, doing renders of all the models I did in past. It took me around 3-4 months to render all the images. I'm using 3Ds Max for hard-surface modeling and ZBrush for detailing things. In general for detailed Hi-Poly model it takes me around a week of work, and then 2-3 days for Low-Poly, UVWS and baking.



ILYA NEDYAL / [www.ilyanedyal.com](http://www.ilyanedyal.com)





You're not only a remarkable modeler but also a dab hand at texturing, but which area do you find the most challenging and why?

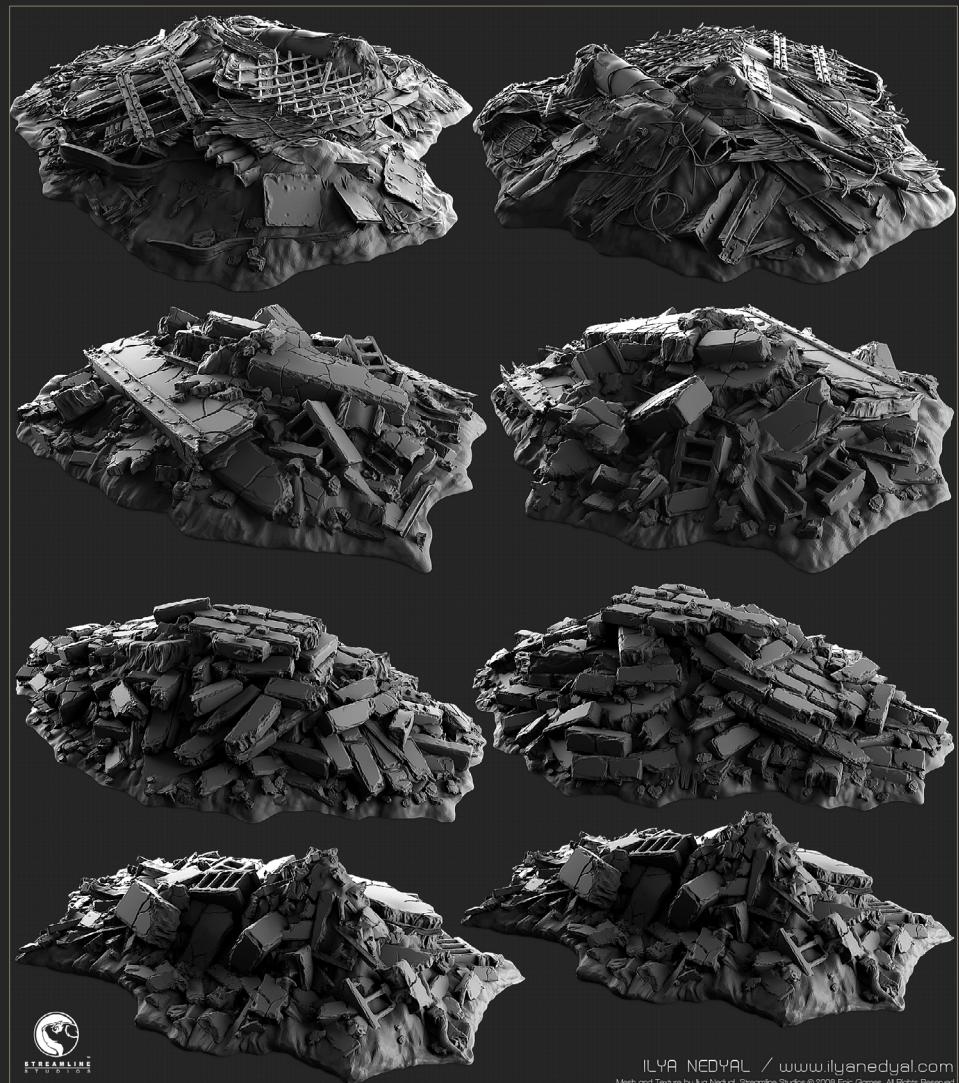
For me the most challenging part is to make a "clean", "new" texture look good. For me damaged and old textures are always easy, there is always something you can add to the texture. But with a clean texture it's sometimes hard, they always look too clean.

So which has been the most challenging project you've had to created textures for?

The most challenging, hmm... To be honest I have been busy modelling stuff and not texturing



ILYA NEDYAL / [www.ilyanedyal.com](http://www.ilyanedyal.com)



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it, but of the textures I made so far, I can't clearly say which was the most challenging. They all have been on about the same level.

Having to sit all day in front of the computer screen is hard on your eyes as well as your back, so occasionally we here in the office would take time out and play a bit of table tennis. What sort of things do you do to help break up the day?

Mostly it's just food or drinks breaks, which I take quiet often.

Well it has been a really pleasure chatting with you today, and I wish you all the best for the future. I would like to wrap this interview up with on last question if I may. If it wasn't for computers what do you think you would have been doing at this present time in your life?

It was a pleasure to answer your questions. I would say if it wasn't for computers, I would still be doing something related to art. Maybe a concept artist, I was learning art before, until I got my first PC.

## ILYA NEDYAL

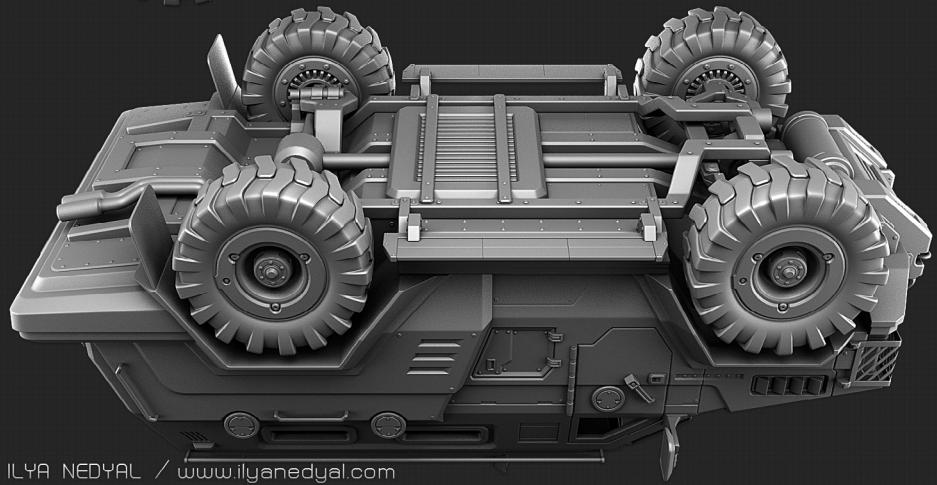
For more work by this artist please visit

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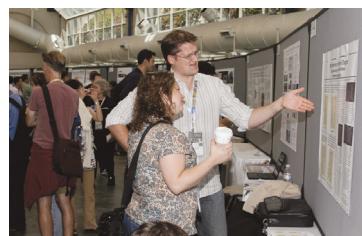
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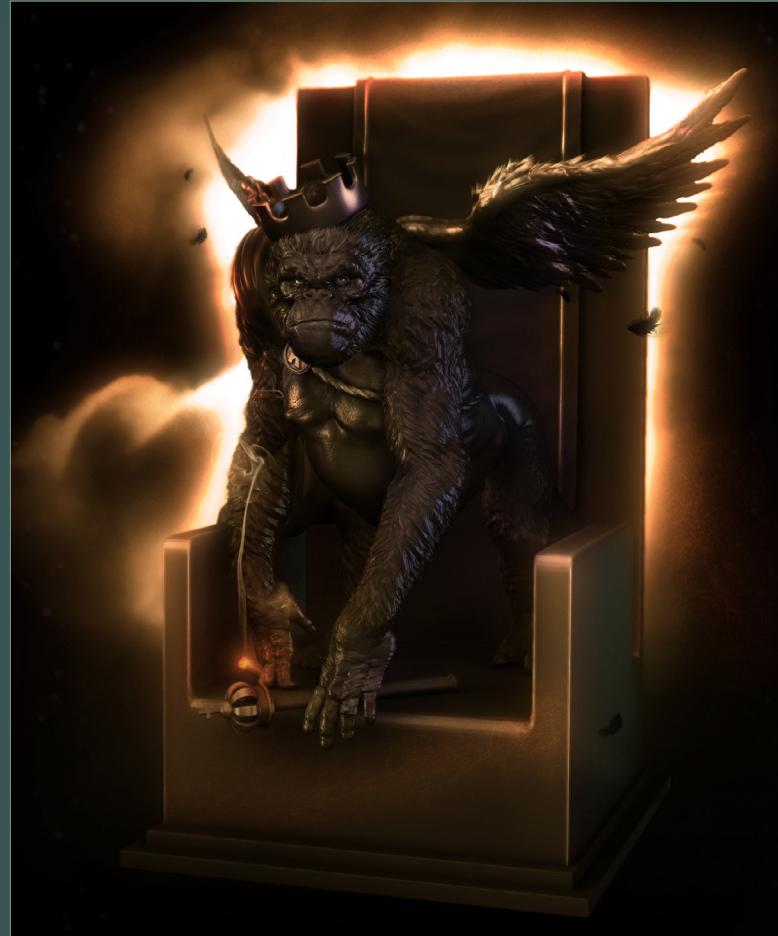
# The Gallery

## GORILLA KING

Maarten Verhoeven

<http://mutte.cgsociety.org/>

[darth\\_mutte@yahoo.com](mailto:darth_mutte@yahoo.com)



## ZOMBIES

Tsvetomir Georgiev

[psychoart123@abv.bg](mailto:psychoart123@abv.bg)



VIN DIESEL

Federico Scarbini

<http://www.federicoscarbini.com>

fede@federicoscarbini.com





## MURSI TRIBESMAN

Adam Skutt

<http://adamskutt.carbonmade.com>

adamskutt@hotmail.com

# FRENZY

Alexander Schumann

<http://www.alexanderschumann.info>

a-schumann@gmx.de



# SECTION 8\_001

Yimin Zhang

<http://zym1983811.blog.sohu.com/>

zym1983811@sohu.com





## INCUBATOR

Indunil Ranwaka

[www.cgbulbs.com](http://www.cgbulbs.com)

[indunil@cgbulbs.com](mailto:indunil@cgbulbs.com)



## CARTOON SNAIL

Ali Chenari

<http://alichenari.cgsociety.org/gallery>

[chenari.cartoon@gmail.com](mailto:chenari.cartoon@gmail.com)

# ENJOYMENT OF MUSIC

Xu Fei

xufei8109@126.com





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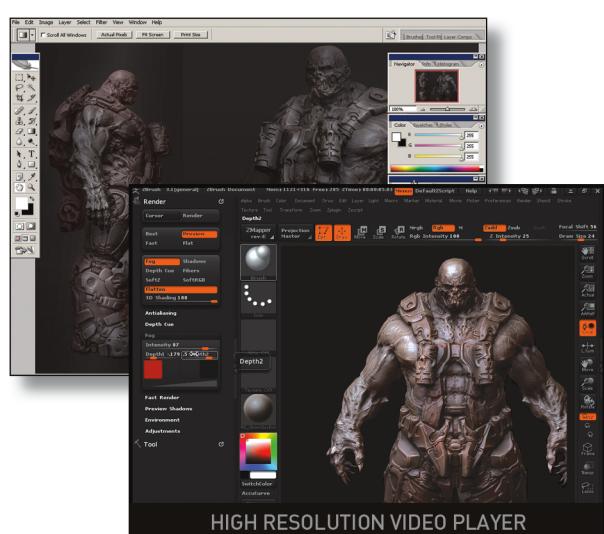
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**PAGE 102**

# ENVIRONMENT LIGHTING

This five part series will focus on the topic of setting up a variety of lighting rigs that reflect natural lighting at different times of the day and manmade interior lighting. Each of the chapters will use the same base scene as a starting point, and will show a step by step guide to finding a lighting and rendering solution that best reflects the desired lighting situation.

The tutorials will explain the type of lights used and how to set up the parameters along with talking about the different methods of tackling the subject. The manipulation of textures may also be covered in order to turn a daylight scene into night scene for example, as well as a look at some useful post production techniques in Photoshop in order to enhance a final still.

## FOLLOW

This month our artists will show you how to turn our seemingly boring scene into a truly atmospheric environment with the first chapter covering Sunset / Sunrise.

So if your interested in seeing the first chapter of this amazing series, please flip to the back of this magazine and enjoy.

- 3DSMAX + MENTAL RAY | PAGE 102
- 3DSMAX + V-RAY | PAGE 120
- CINEMA 4D | PAGE 148
- MAYA + MENTAL RAY | PAGE 154



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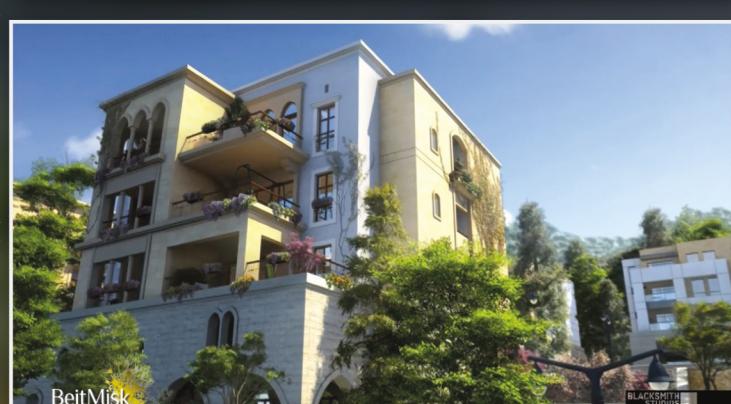
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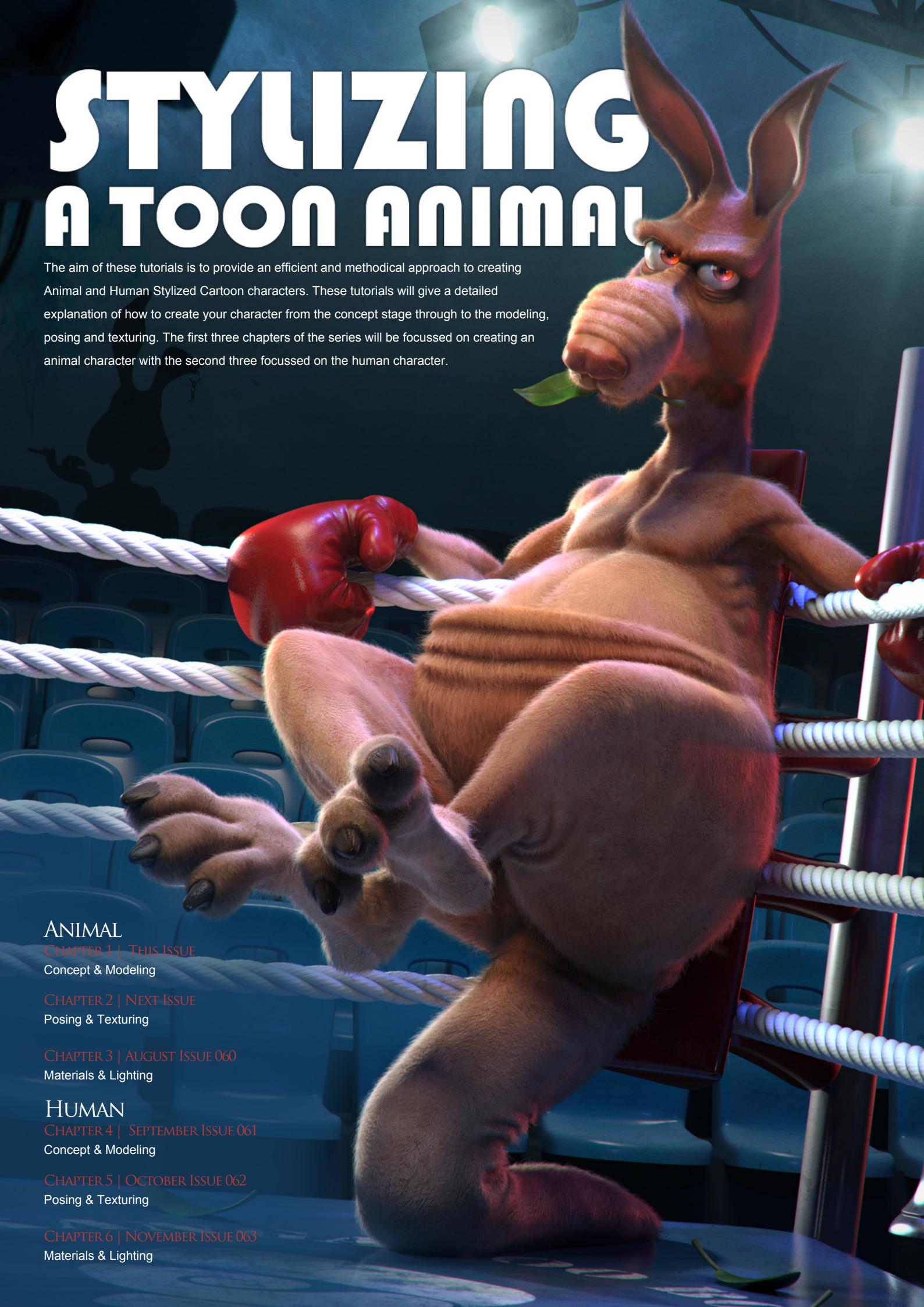
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# STYLIZING A TOON ANIMAL

The aim of these tutorials is to provide an efficient and methodical approach to creating Animal and Human Stylized Cartoon characters. These tutorials will give a detailed explanation of how to create your character from the concept stage through to the modeling, posing and texturing. The first three chapters of the series will be focussed on creating an animal character with the second three focussed on the human character.



## ANIMAL

CHAPTER 1 | THIS ISSUE

Concept & Modeling

CHAPTER 2 | NEXT ISSUE

Posing & Texturing

CHAPTER 3 | AUGUST ISSUE 060

Materials & Lighting

## HUMAN

CHAPTER 4 | SEPTEMBER ISSUE 061

Concept & Modeling

CHAPTER 5 | OCTOBER ISSUE 062

Posing & Texturing

CHAPTER 6 | NOVEMBER ISSUE 063

Materials & Lighting

## HOW TO STYLIZE AND MODEL 'TOON ANIMALS' CHAPTER 1 - CONCEPT

Software Used: 3ds Max & ZBrush

### INTRODUCTION

I am really glad to be invited to create this tutorial. Cartoon characters are by far my favorite subject, so it is a pleasure to write this for you. More than writing a step by step tutorial my objective is to teach you a process in which you can contribute with your own creativity and customize the character to your liking. After finishing this tutorial you should be ready to create your own characters.

It would be easier to supply you with a front and side view to use as a modeling reference, but I am not going to do that. We will start with an idea of a character and develop it along the way. Today's tools allow us to explore and study our concept whilst modeling and we are going to take advantage of that. We will be sketching in 3D and my favorite tool for that is ZBrush.

But that doesn't mean that we will pick up a sphere and model the full character from it. We



Fig.A

will start by creating a very simple mesh with a topological base that will allow us to develop the model without a lot of trouble. For that we have to predict some of the pitfalls that we might face. We have to study our subject a bit before starting in order to understand its anatomy and particular features, which should be present in the base mesh.

For our animal character I have picked the kangaroo. (Fig.A) It's an animal with unique

characteristics: it hops around, uses its tail for support, has funny proportions and is known for its boxing skills. As I had never modeled a kangaroo, the first step was to gather some information about it. I have searched the internet for kangaroo's photos, drawings and skeletons. Then I have started to draw some kangaroos while using the photos for reference. It is the best way to understand their anatomy, because you have to think about it while drawing, and the more you draw the more you know the subject. Sketching the subject's skeleton is also a great way to understand its structure. If your objective is to rig and animate the character, sketching the skeleton is a must. (Fig.B)

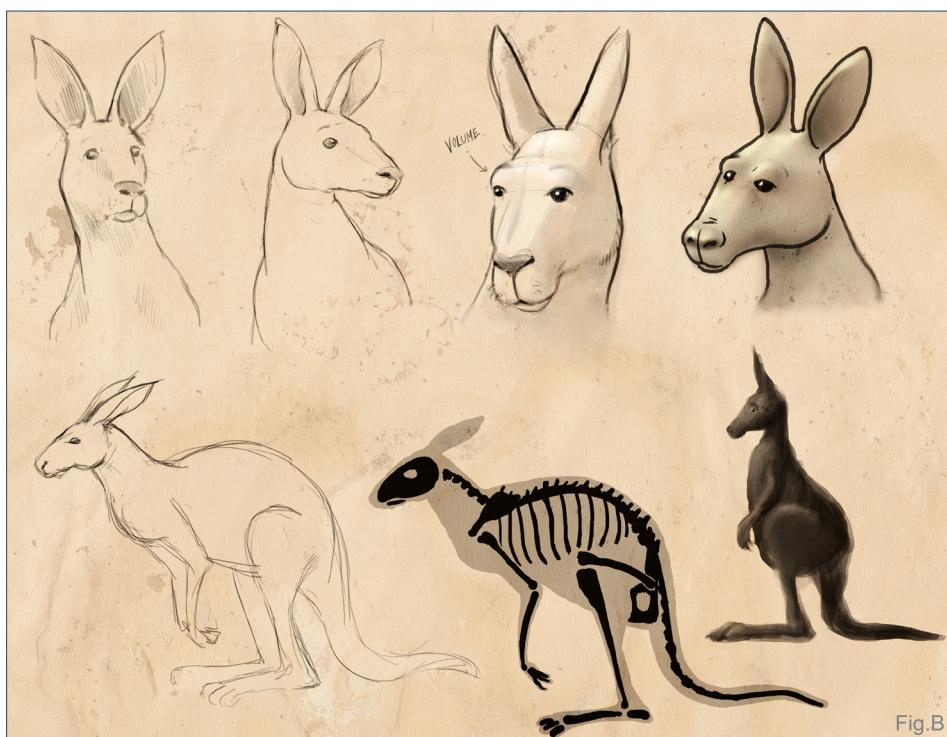


Fig.B

Kangaroos have got very powerful legs, with massive thighs, long leg bones and big feet. Most of their body mass is on the lower part of the body. Their arms look quite feeble, but the shoulder area is stronger and projected forward. The snout is long as well as their ears. The tail is thick and a lot of the time is used for support, such as when they are fighting and thrust their feet forward while standing on their tails! (Fig.C)

It is very important to be aware of these characteristics because they define the animal. Our challenge is to turn this charming animal into a cartoon.

## WHAT IS A CARTOON?

What makes an animal character a cartoon rather than realistic?

**Stylization** – Cartoons are simple and clear in form with an immediately recognizable silhouette. The introduction of clear geometric shapes and sharp angles versus curved lines are part of the cartoon language. Also, complex forms like hair and fur tend to be reduced to masses or shapes (Warner Brothers cartoons are a great example of this).

**Exaggeration** – Extreme deformations or caricature contribute to stylization and humor, as well as to defining the personality of the character. We all know the stereotypes of the big headed scientist and the broad shouldered warrior.

**Humor** – I would say humor is what differentiates cartoons from action comics. Light humor, nonsense or sarcasm are all part of the cartoon universe. All dictionary definitions that I have found for "cartoon" mention humor as a defining characteristic.

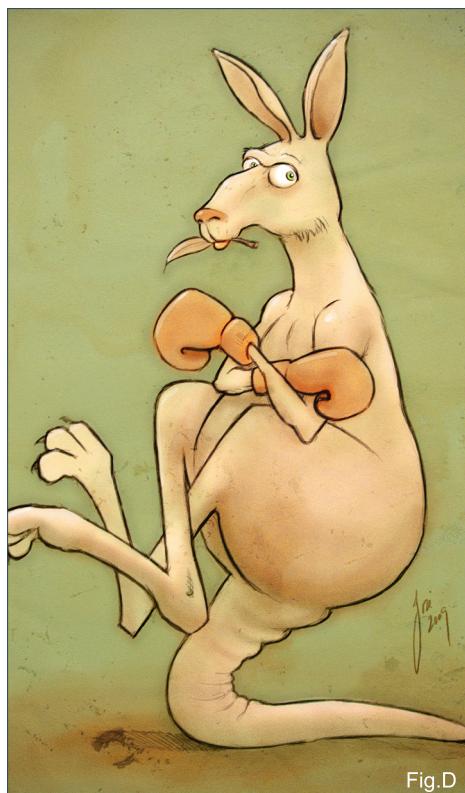


Fig.D

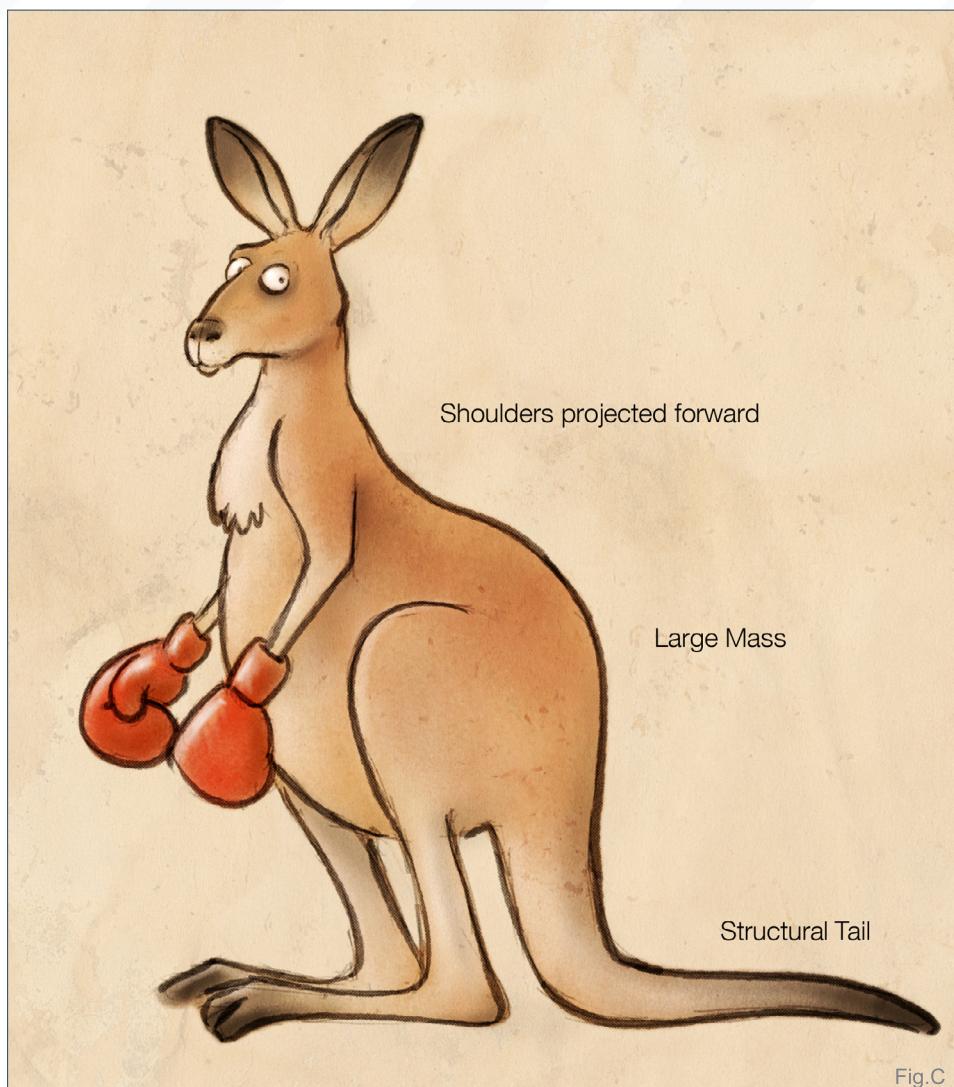


Fig.C

**Human characteristics** - In cartoons we expect the character to inherit human characteristics, not only in terms of expression but also in their anatomy. Sometimes parts of the animal anatomy are fully altered, for example making both eyes face forward when the animal has eyes on the side of its head or giving human hands to mice and ducks, like Walt Disney did.

**Color code** – Cartoons' color code is usually very direct and saturated. These are characteristics that made the process of inking and coloring in traditional animation a lot easier, as each frame had to be painted individually and it is a lot more difficult to keep color and form consistency with multiple color gradients.

**Attitude** – Any character without personality is a dead character. His personality is transmitted

to the viewer by the silhouette and the attitude, pose and facial expression. Make your character alive!

## TUTORIAL

I have created a first character sketch to give me a reference through the modeling process (**Fig.D**), but it will be adjusted along the way in order to meet all the criteria defined above.

In this first chapter we will start by modeling the character starting in 3DS Max and continuing the exploration of form in ZBrush, trying to achieve the Stylization, Exaggeration and Human characteristics.

We will start by creating a low polygon mesh in 3DS Max using a box and polygon modeling tools.

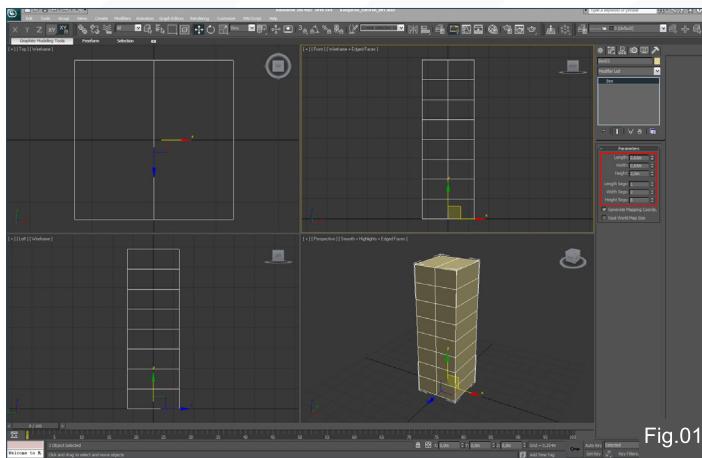


Fig.01

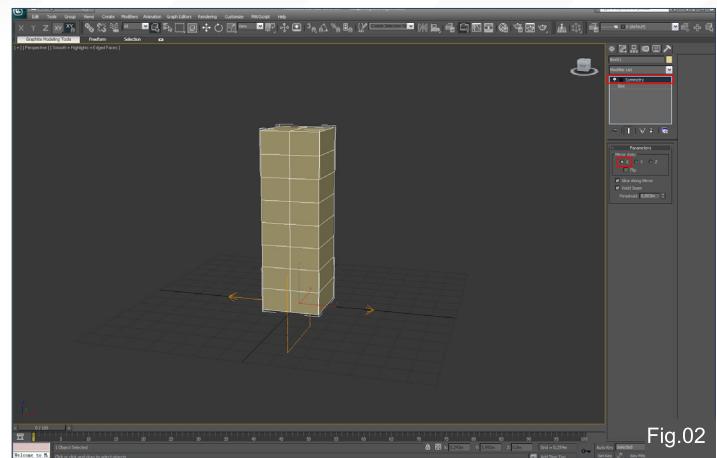


Fig.02

## Creating the Box (Fig.01)

- Open 3DSMax
- Set you scene units to Meters by going to the Customize menu, choosing Units Setup and picking "Metric" in the Display Unit Scale.
- Go to the Command Panel and from the Standard Primitives click on the Box button.
- In the Top view click and drag to create a box.
- With the box selected go to the Command Panel and change the box's dimensions to: length 0.65m, width 0.65m, height 2.0m. Use 1 segment for the length, 2 for the width and 8 for the height.

I am using meters as units, but you can use any units you feel familiar with. It is important to be aware of the correct scale of the scene. This way when you have to build props you can think of the dimensions they have in real life. If

you use an arbitrary scale you will have to rely on the comparison between different objects to check if they are correct in size. In this case we will be modeling a kangaroo so I have decided to start with a height of 2 meters.

## Symmetry Modifier (Fig.02)

- Under Modify in the Command Panel pick the Symmetry Modifier.
- Make sure it mirror is along the X Axis.

With the Symmetry Modifier we will only have to model half of the kangaroo, as everything we do in one half will be replicated to the other. I prefer to have the Symmetry modifier applied from the start as it allows us to check the volume of the full character as we model.

## Edit Poly (Fig.03)

- From the Modifiers list pick Edit Poly.
- Drag "Edit Poly" down so that it is placed between the Box and Symmetry modifiers.
- Make sure the "Show end result toggle" is ON. This allows us to change a modifier in the middle of the stack but to see the result of the full stack. If it was OFF we wouldn't be able to see the result of the symmetry modifier.

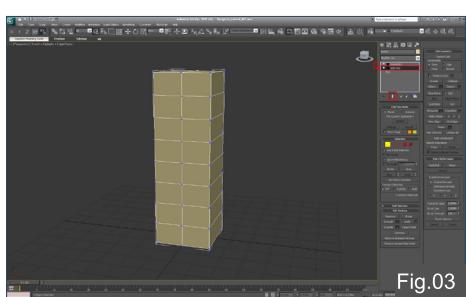


Fig.03

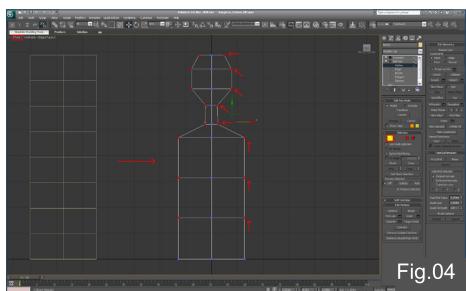


Fig.04

## Shaping 1 (Fig.04)

- Choose the Front view (press F).
- In the Edit Poly modifier pick the Vertex sub-object mode.
- Using a selection window, choose the vertexes on the right side of the box and move them in order to create a rough silhouette of a trunk and a head.

By using a selection window you make sure that you are selecting the vertexes on the front and the ones on the back simultaneously.

## Shaping 2 (Fig.05)

- Choose an Orthographic View (press U)
- By dragging the Mouse with the middle button and pressing Alt you can orbit around your model. By dragging with the middle mouse button you can pan.
- Make sure you have the Orbit mode changed to Orbit Sub Object, this way you will always orbit around the area you are working on.
- Pick a comfortable point of view and keep shaping the vertexes as in the figure, in order to create a rounder head and body.
- Use the "World" Reference Coordinate System to move the vertexes. It will be easier to understand how you are moving them in space. If it gets confusing move the vertexes along one axis at a time, by dragging over the X, Y or Z axis on the coordinate system.
- Keep orbiting the model while shifting the vertexes to have a clear understanding of the overall form.

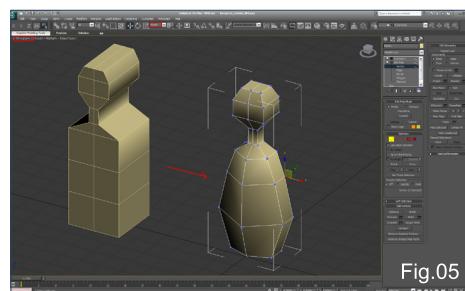


Fig.05

### Shaping 3 (Fig.06)

- From the Edit Poly modifier choose the Edge sub object.
- Pick one of the horizontal edges near the center line (check figure)
- Choose the Ring option for the edge selection
- Click the Connect tool

This will create an edge loop which will give us a better base to start extruding the arms and legs from.

### Shaping 4 (Fig.07)

- From the Edit Poly modifier choose the Vertex sub object mode.
- Shift the vertexes in order to give more volume to the belly, flatten the chest and make the neck rounder.

Try to place the vertexes in a position similar to the figure, but don't worry too much about precision, later we will have the ability to reposition everything in ZBrush.

### Arms 1 (Fig.08)

- From the Edit Poly modifier choose the Polygon sub object mode.
- Pick the polygon from which the arm should grow.
- Click the Dialog Box near the Extrude tool.
- In the Extrusion Height Field insert 0.9 meters.

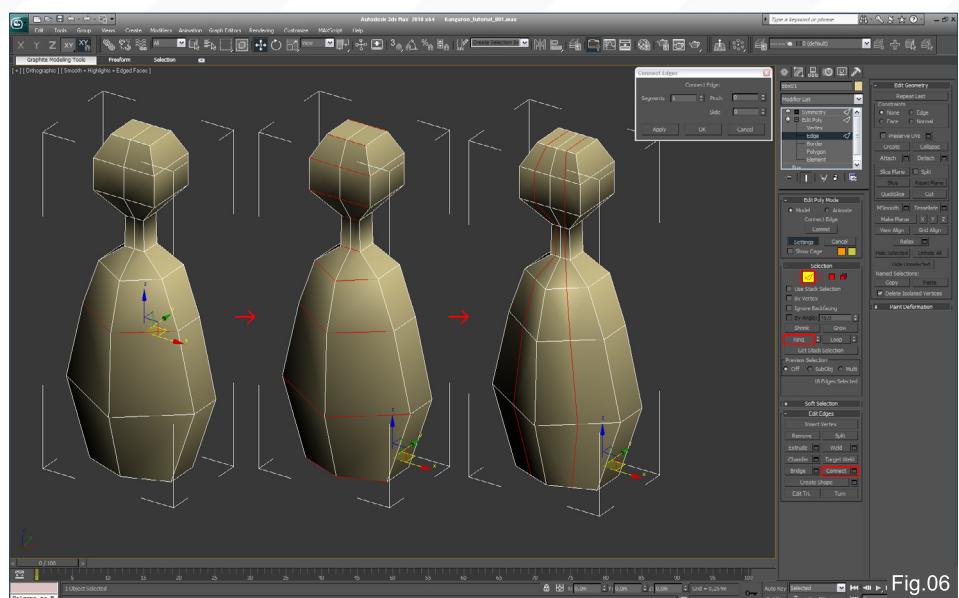


Fig.06

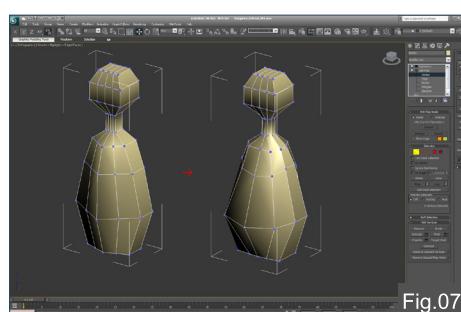


Fig.07

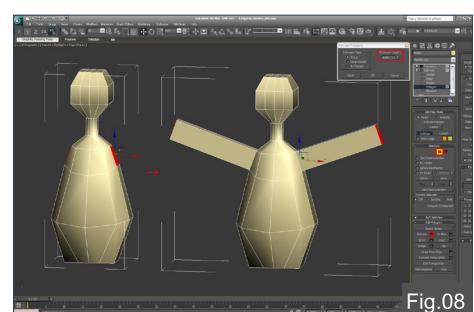


Fig.08

### Arms 2 (Fig.09)

- Turn on the Snap toggle (press S key) and make sure the snap3D is selected.
- With a right click on the Snap Toggle button you can change the Snap Settings, make sure Vertex is ON, so that it will snap to the vertexes.
- With the Polygon sub object mode selected

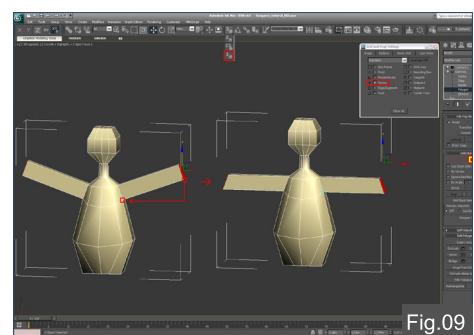


Fig.09

and with the axis gizmo limited to moving along the Z Axis (press F7 key), pick one of the lower vertexes in the "hand area" and drag it to the "armpit" vertex. This will keep the arm horizontal, which is easier to model.

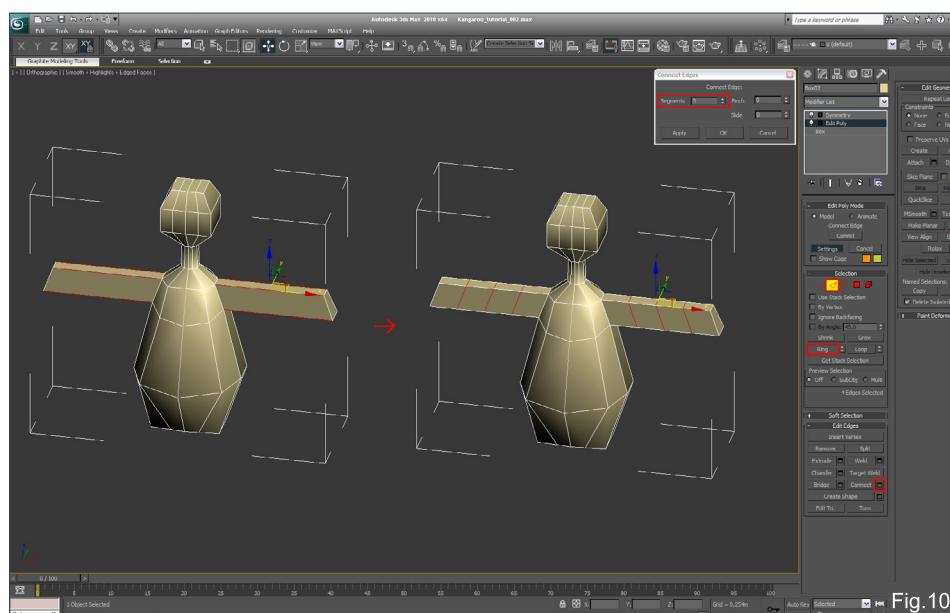


Fig.10

### Arms 3 (Fig.10)

- From the Edit Poly modifier choose the Edge sub object mode.
- Pick one of the edges along the arm.
- From the Selection Tools press Ring and it will select all the edges along the arm.
- Click the Connect tool dialog box and increase the number of segments to 3.



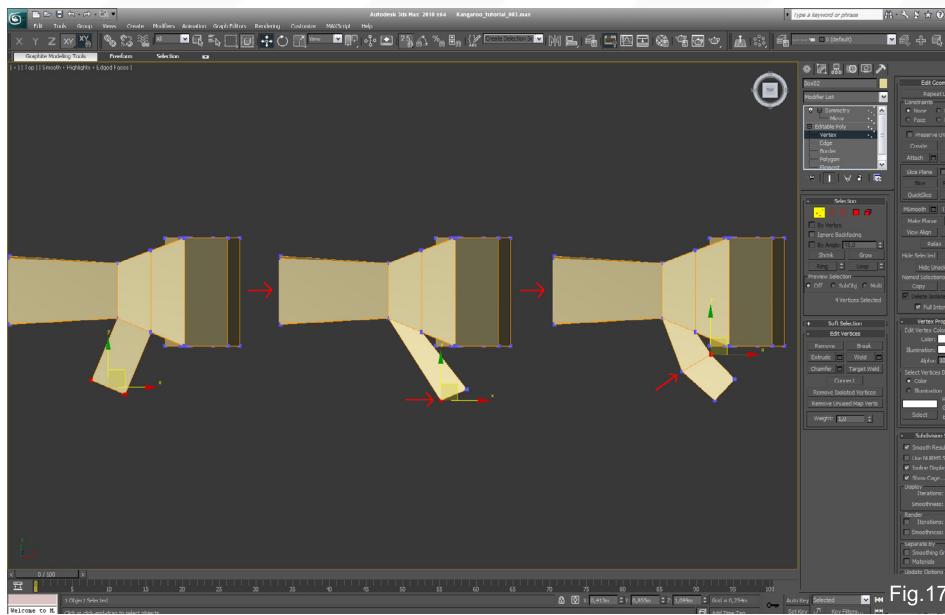


Fig.17

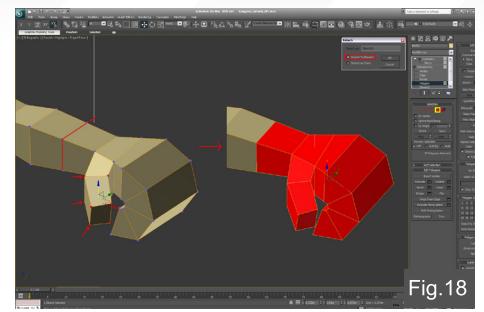


Fig.18

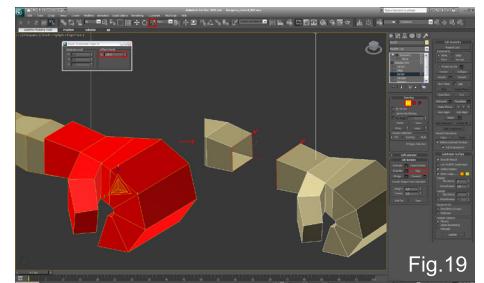


Fig.19

-Select the face from which we will extrude the thumb.

-Pick the Extrude Tool Dialog Box and extrude about 0.13m to create the thumb.

### Hand 3 (Fig.17)

-In Top View, select the thumb vertexes.

-Pull them to the right.

-Create an edge loop in the middle of the thumb.

-Shape the vertexes to create a larger thumb slightly bent.

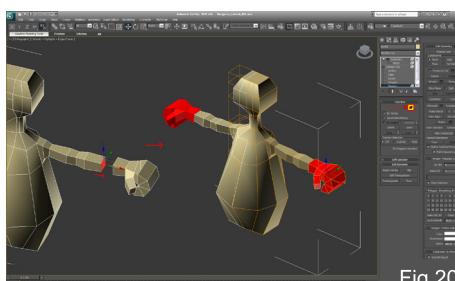


Fig.20

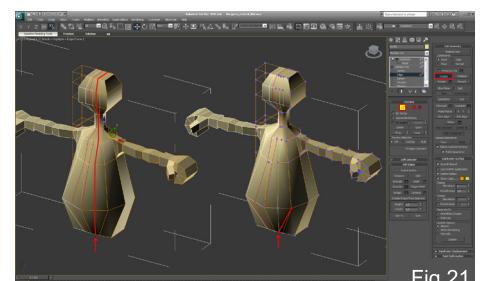


Fig.21

### Hand 4 (Fig.18)

-Pull the thumb vertexes down in order to make the thumb to look more natural.

-Create an edge loop around the forearm.

-Select the faces of the hand and half of the

### Hand 5 (Fig.19)

-Right Click on the Scale Button from the Tool bar and set the scale to 120%

-Move the glove to separate it from the arm.

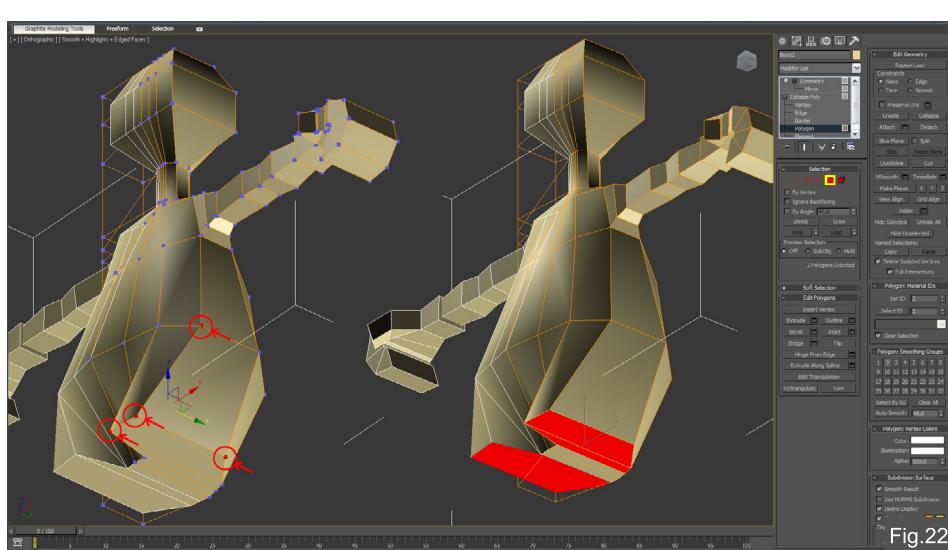


Fig.22

### Hand 6 (Fig.20)

-Extend the face on the front of the forearm and scale it down a bit.

-With "Element" sub object selected pick the glove and place it correctly relative to the arm.

### Legs 1 (Fig.21)

-Create a vertical edge loop as indicated in the figure

-In Edge sub object mode, Pick Create from "Edit Geometry" and click on the 2 vertexes in the figure, this will create an edge that separates the lower belly from the thigh.

### Legs 2 (Fig.22)

-Move the indicated vertexes forward to start creating the upper thigh.

-Select the faces under the thigh.

# HOW TO STYLIZE AND MODEL 'TOON ANIMALS' Chapter 1 -Concept

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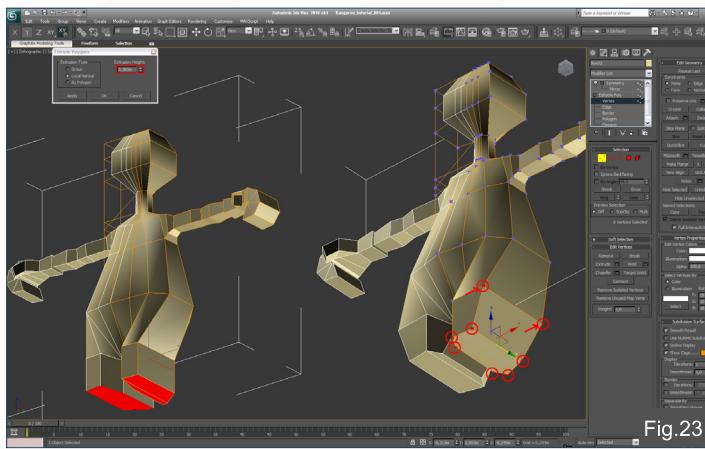


Fig.23

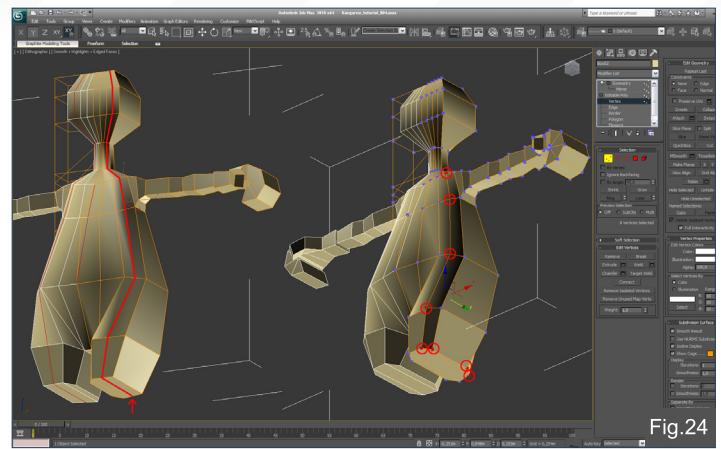


Fig.24

## Legs 3 (Fig.23)

-Use the Extrude dialog box in Face sub object mode, and use a value of about 0.30m

-In Vertex sub object mode, reshape the thigh as shown in the figure.

## Legs 4 (Fig.24)

-Create another edge loop which splits the thigh vertically (check figure)

-Reposition the new vertexes in order to shape the thigh section in a sort of chamfered rectangle. This will give us a good section to keep extruding the leg.

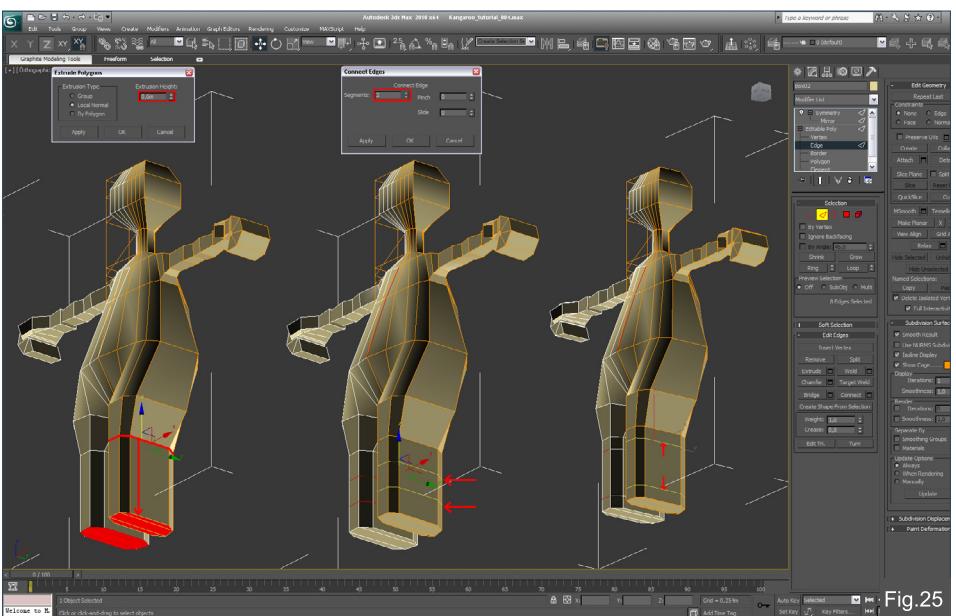


Fig.25

## Legs 5 (Fig.25)

-Extrude the leg section about 0.60 m.

-Create 2 edge loops around the leg.

-Shift the top edge loop up to create the knee area.

-Shift the lower edge loop down.

-Press F3 to view the model in Wireframe.

-Turn on Snap (press S). Change the Snap to 2.5 Mode (Left Click on the Snap button and pick the 2.5 option). This way the vertexes will only move parallel to the screen space.

-Align all the vertexes on both sides of the leg by dragging them to the nearest vertex.

With the vertexes aligned, when we use a selection window we will be sure to be selecting the vertexes on both sides of the leg.

## Legs 6 (Fig.26)

-Choose an Orthographic view from the Right.

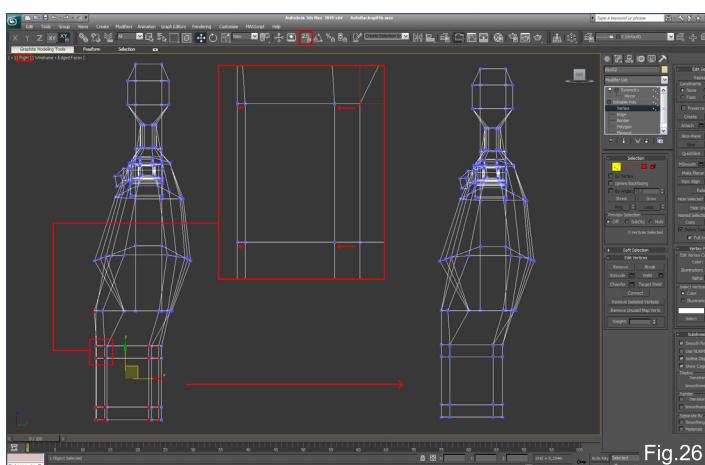


Fig.26

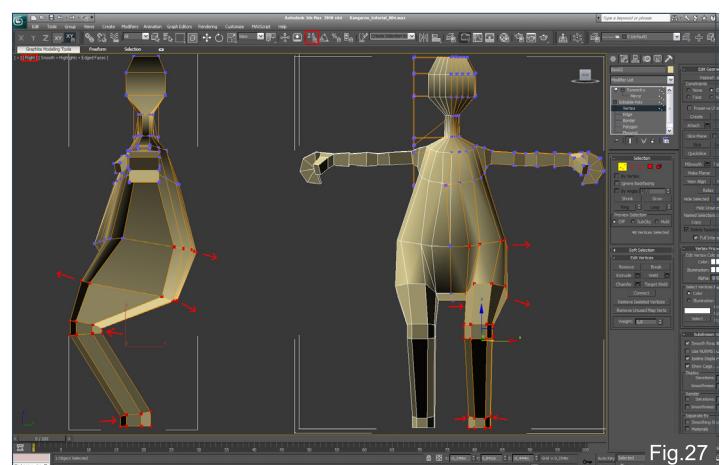


Fig.27

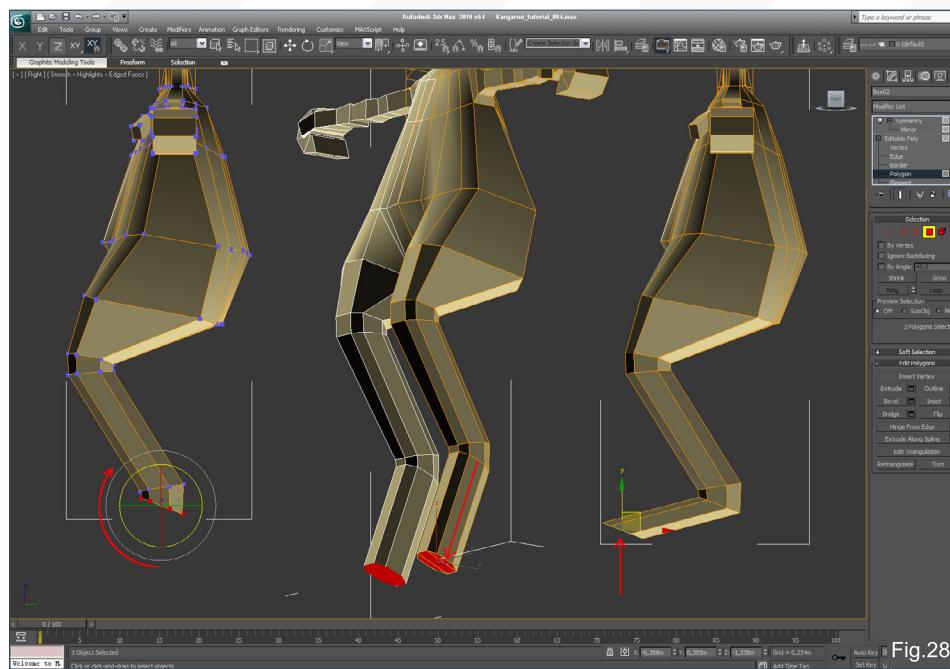


Fig.28

- With a window selection pick the vertexes and shape the thigh, knee and leg (like figure).
- Change the view to Front.
- Shape the thigh and leg from the front (like figure).

### Legs 8 (Fig.28)

- Select the lower vertexes of the leg.
- Rotate the selection, in order to prepare for the extrusion of the feet.
- Select the faces of the section and extrude the feet.
- Choose the Right viewport and move the section up.

### Legs 9 (Fig.29)

- With the section still selected rotate it in order to be vertical.
- Scale the section non uniformly along the world Z axis until all the edges are parallel.
- Extrude the section once again.

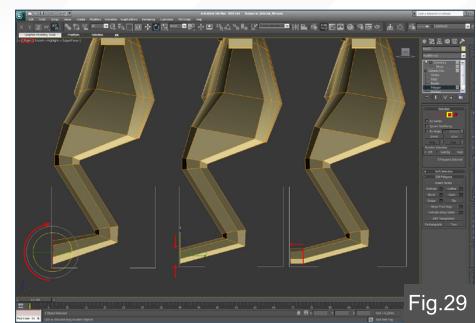


Fig.29

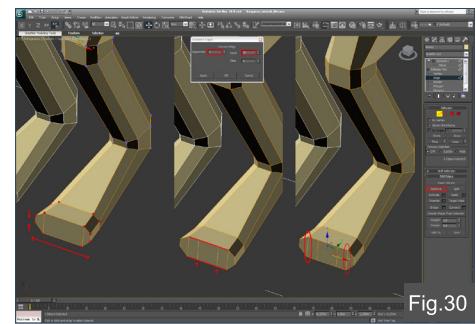


Fig.30

### Legs 10 (Fig.30)

- Shape the vertexes at the tip of the foot in order to make it wider and flatter.
- Connect the edges of the wider face at the tip of the foot using the Connect dialog box.
- Use 2 connecting segments and a pinch value of 30.

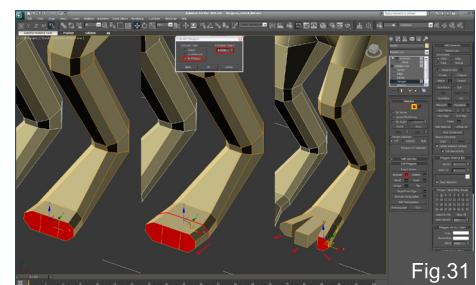


Fig.31

- Select the edges marked on the figure and pick the Remove option from "Edit Edges", this will allow us to extrude the 3 fingers simultaneously.

### Legs 11 (Fig.31)

- Select the 3 polygons from which we will extrude the fingers.
- Use the Extrude dialog box from "Edit Polygons", make sure that the Extrusion Type is "By Polygon". Use an extrusion value of about 0.13m .
- Select each polygon at the finger tip and spread them apart.

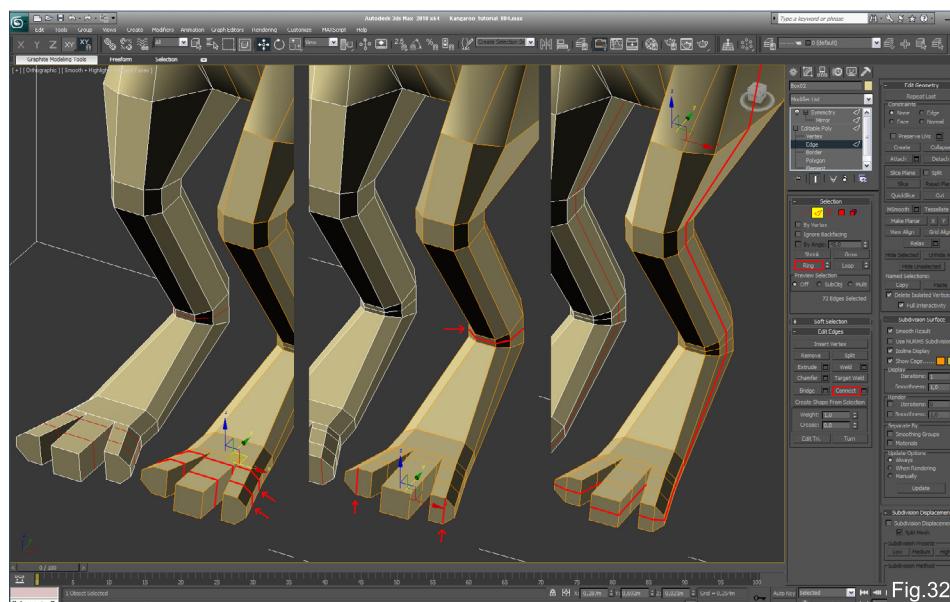


Fig.32

### Legs 12 (Fig.32)

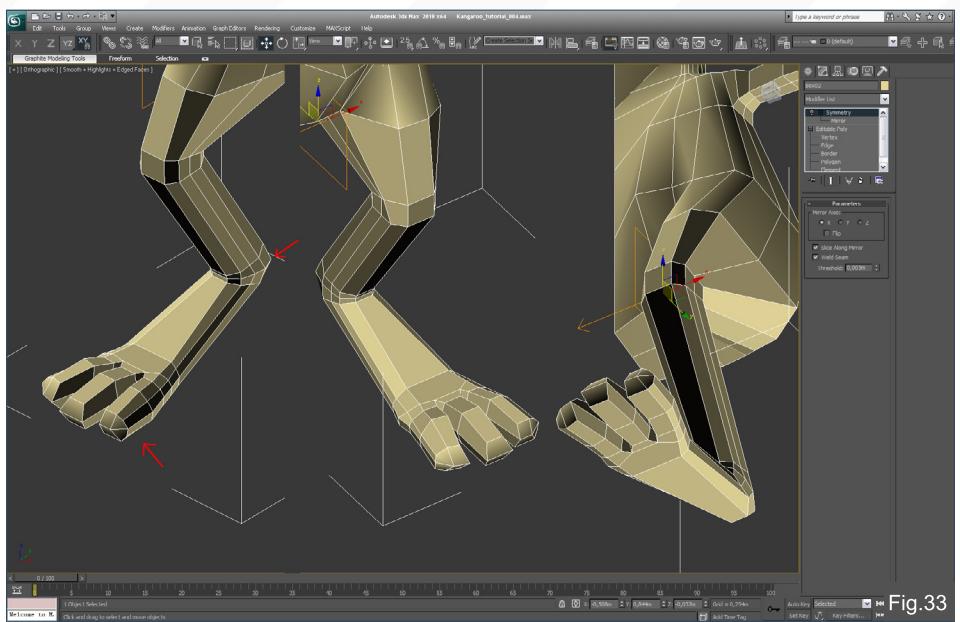
- Create 2 edge loops along the fingers.
- Create an extra edge loop at the ankle
- Recreate the edges we had removed before.
- With one of these new edges selected, use the Ring option, followed by Connect. This will create a new edge loop that will split the fingers horizontally.

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## Legs 13 (Fig.33)

-Start shaping the vertexes of the foot in order to make the fingers rounder. You can try to make the final position in your model resemble the figure, but it is not mandatory, everything will be reshaped in ZBrush later. I have presented different points of view so that you can follow it better. It is also helpful to momentarily disable the symmetry modifier so that you have a clearer view of the inner side of the foot. Don't forget to use the Edge Constraint (under Edit Geometry>Constraints>Edge) if you wish to move vertexes along the edges.



## Head 1 (Fig.34)

We will now start creating a base shape for the head.

Our main concern will be to create a workable geometry in the area of the snout, ears and eyes.

- Select the 2 polygons in the middle of the face.
- Use the Extrude Dialog Box and insert a value

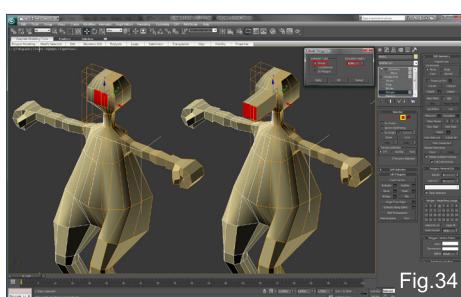


Fig.34

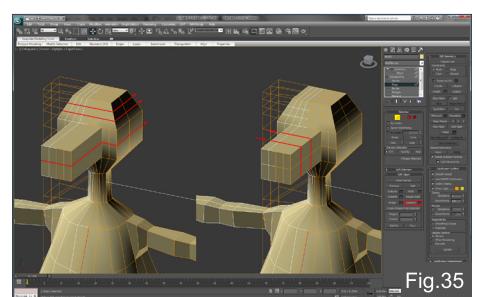


Fig.35

of 0,40m (don't forget to set the extrusion type back to "Group" or it will extrude each face individually).

top half of the face.

- Create 2 edge loops along the snout.

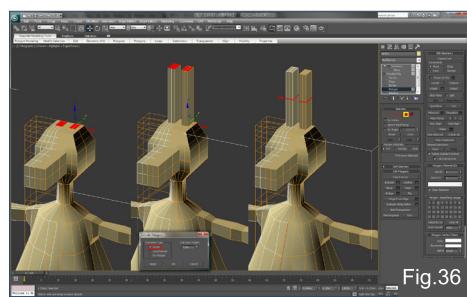


Fig.36

## Head 2 (Fig.35)

- Create one edge loop horizontally across the snout, and 2 edge loops horizontally across the

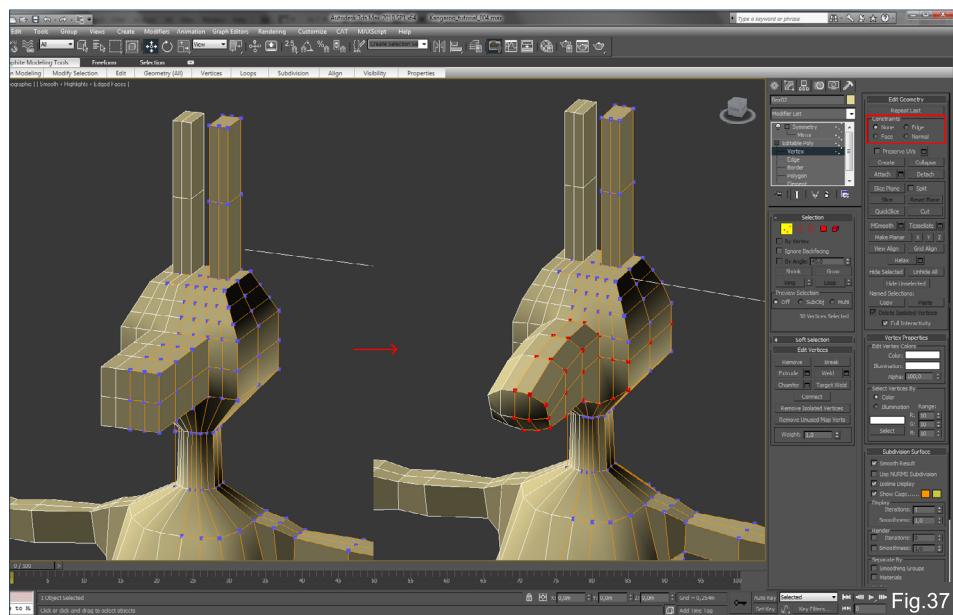


Fig.37

- Select the polygons on the top of the head (see figure) and extrude them 0.50 m.

- Create a horizontal edge loop that splits the ears.

## Head 3 (Fig.36)

We will start shaping the head freely:

- Move the vertexes to shape the snout to resemble the initial sketch roughly. There aren't a lot of tricks here, just moving the vertexes in space and orbiting around the volume to check the volume.

**TIP:** In Orthographic View only move the vertexes along one of the axis (X, Y or Z) at a time, it is easier not to get lost in space. :). Use the Constraints inside "Edit Geometry" to limit the vertex movement along the edges or in the same plane of the surrounding faces.

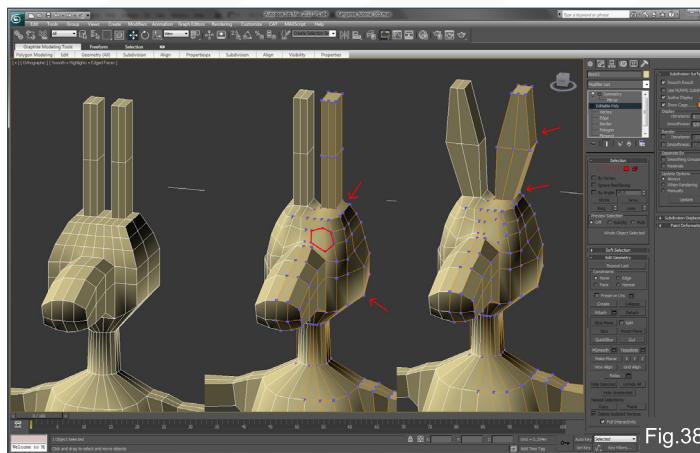


Fig.38

### Head 5 (Fig.38)

-Keep shaping the head, making the cheeks rounder.

-Move the vertexes in the eye area, creating a rough round shape. Use the Face Constraint inside Edit Geometry to move the eye contour vertexes on the same plane.

-Move the vertexes of the ears to shape them correctly.

### Head 6 (Fig.39)

-Always moving the vertexes, on the back of the head, make it rounder and the ears thinner.

-Make two new edge loops along the ears.

Select the vertexes of the ears and rotate them slightly outwards.

-Move the vertexes on the back of the ears to make them rounder.

### Head 7 (Fig.40)

-Select the vertexes of the neck and scale them on the X and Y plane to increase its thickness.

-Select all the vertexes of the head and pull it up and slightly forward to make the neck longer.

-Scale the vertexes at the base of the neck a little bit more to make it thicker in this area.

-Pull the vertexes of the area where the head meets the neck a little bit back so that the back of the head is more in tune with the neck.

### Head 8 (Fig.41)

-Select the polygon in the nose area and extrude it about 0.07m.

-The nose might split as we extrude the polygon, if it is facing outwards. If that happens, select

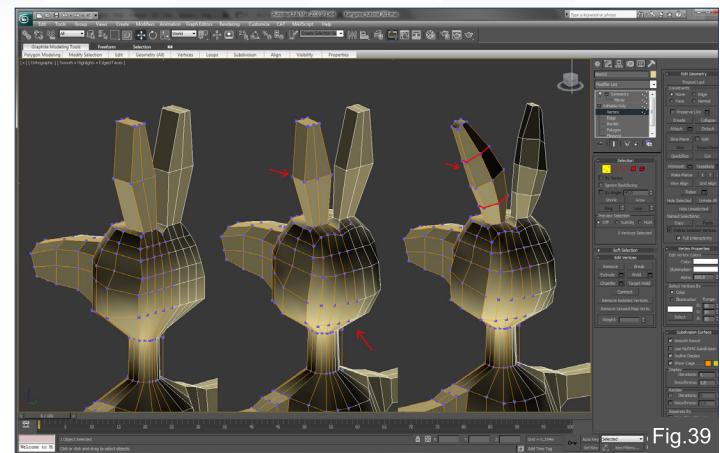


Fig.39

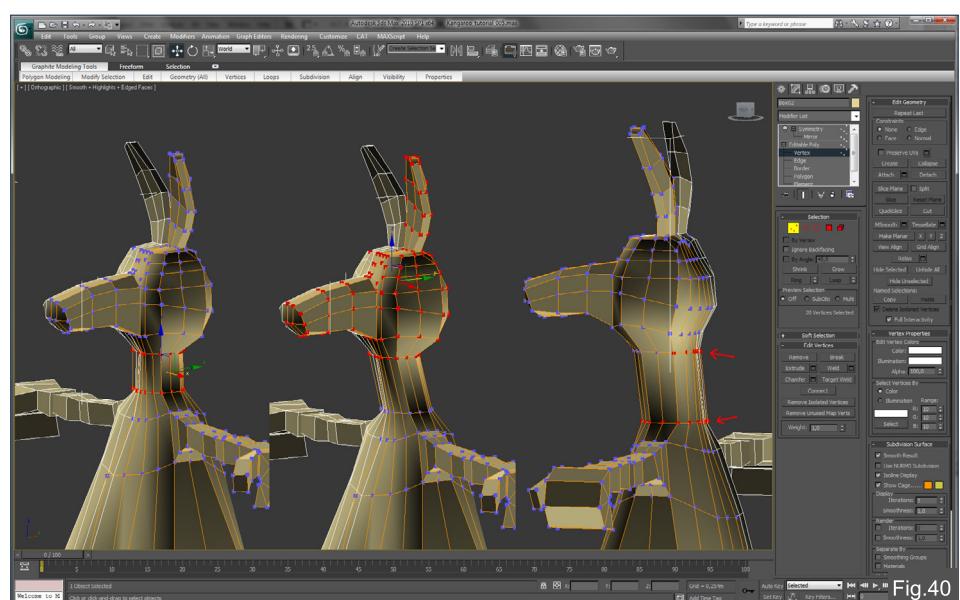


Fig.40

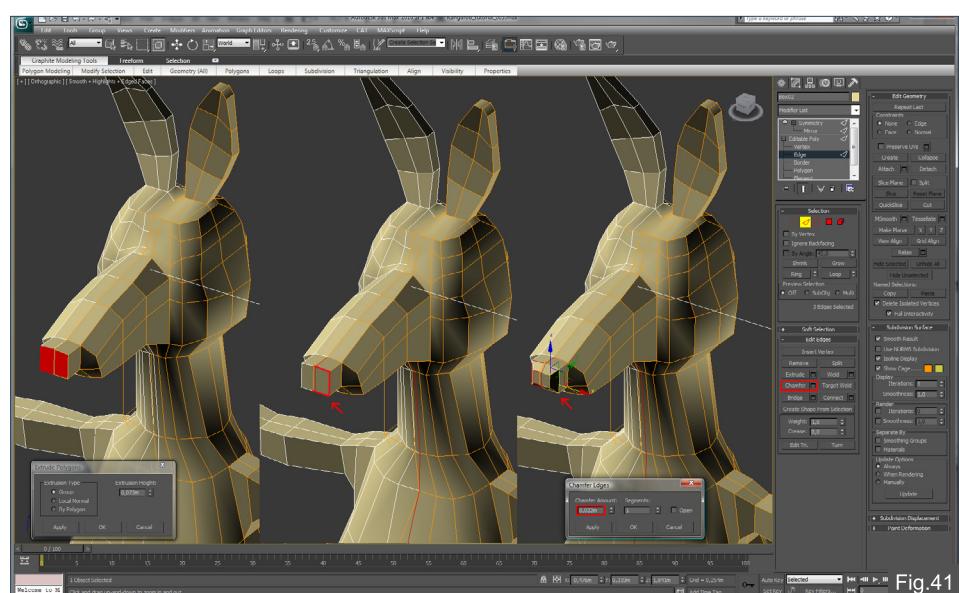


Fig.41

the edge nearer the symmetry plane, and pull it to the other side of the mirror, the vertexes will weld automatically.

-Select the edges at the tip of the nose with the

exception of the edge at the mirror plane.

-Use the Chamfer dialog box and insert a Chamfer amount of about 0,02m to make the nose "round".

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## Head 9 (Fig.42)

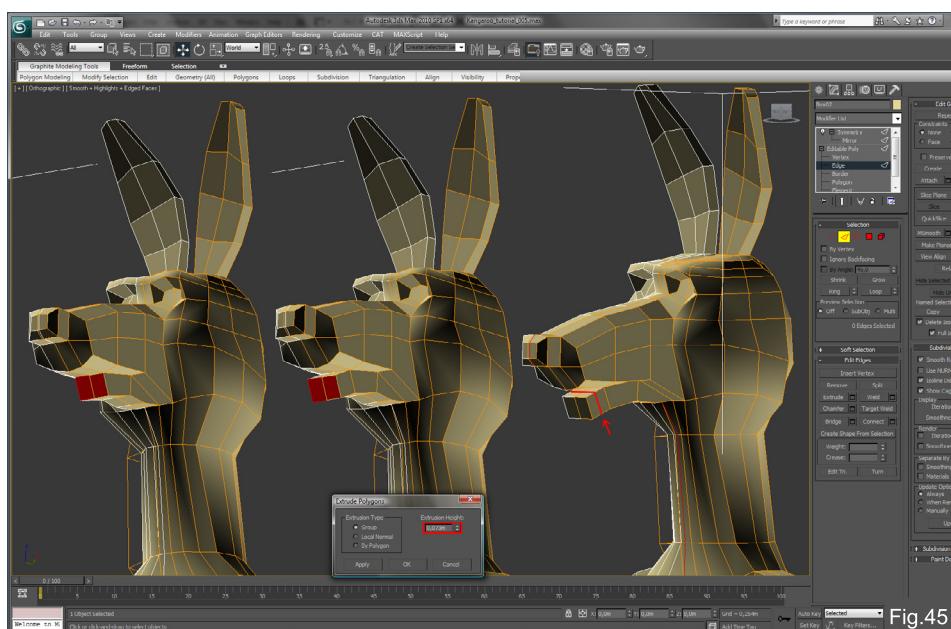
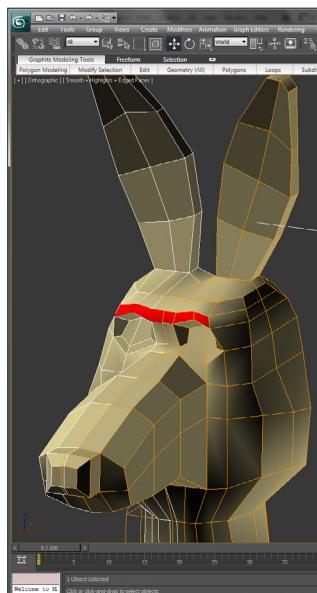
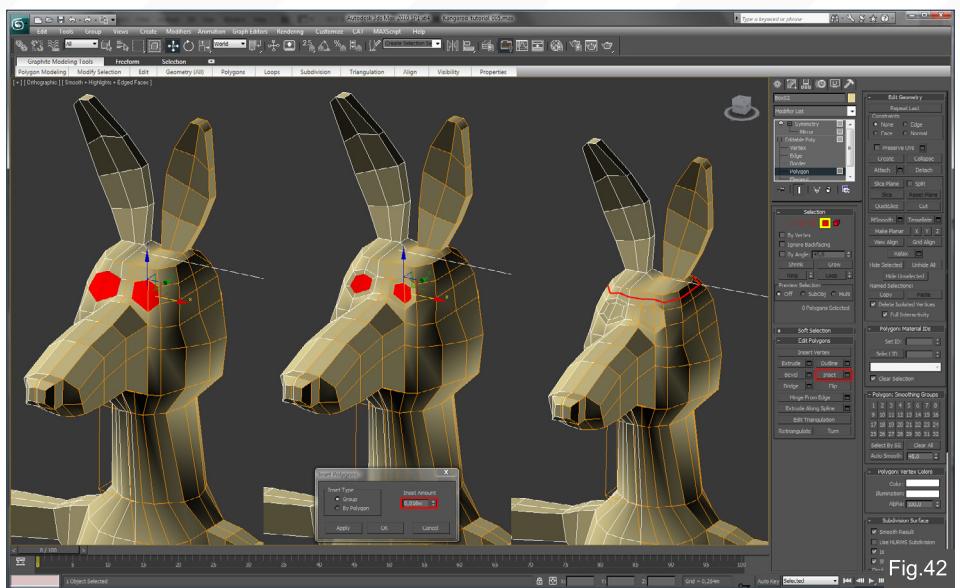
- Select the 2 polygons that define the eyes.
- Click the Inset dialog box and insert an Inset Amount of about 0,016m.
- Create a new edge loop at the brow area.

## Head 10 (Fig.43)

- Select the polygons of the brow area and pull it forward and slightly upwards.
- Move the vertexes to shape the area around the eye and cheeks (Please check the figure).

## Head 11 (Fig.44)

- Select the polygons under the snout (as in the figure).



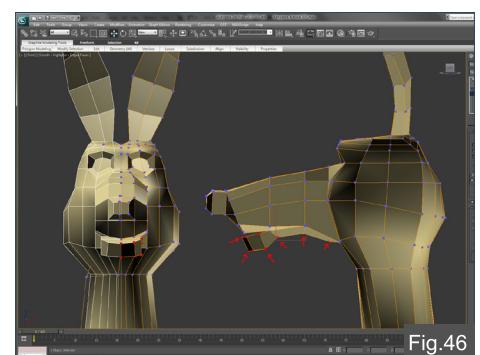
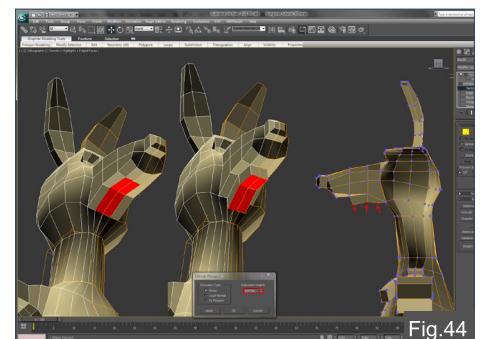
- Extrude the polygons about 0,07m.
- In a Side view move the vertexes to create the mouth.

## Head 12 (Fig.45)

- Select the polygon at the front of the mouth.
- Extrude it about 0,07m.
- Create an edge loop around the lip area (check figure).

## Head 13 (Fig.46)

- Move the vertexes according to the figure to define the mouth area.



### Head 14 (Fig.47)

- Select the inner polygons of the ears.
- Use the Inset Dialog box with an Inset amount of about 0,02m.
- Push the vertexes inside the ears inward to create a cavity.

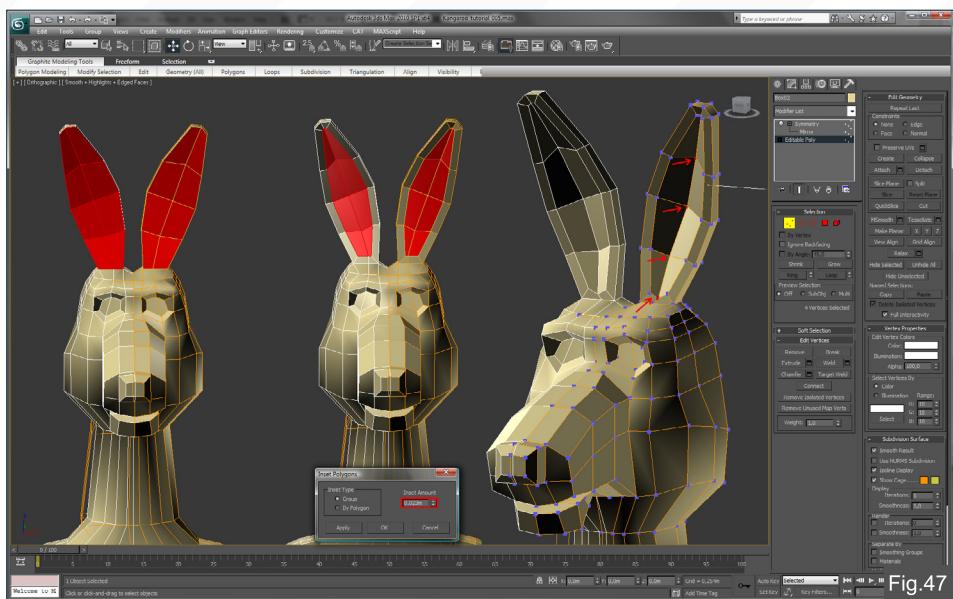


Fig.47

### Arms 1 (Fig.48)

- Create one horizontal edge loop above the shoulder line.
- Create another horizontal edge loop along the length of the arms.
- Extend the length of the forearm and bicep area in order to make the arm more proportional with the character.



Fig.48

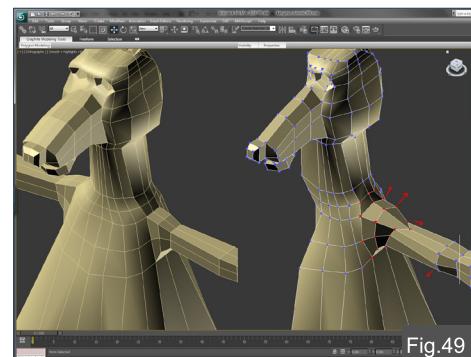


Fig.49

### Arms 2 (Fig.49)

- Move the vertexes of the shoulder area to create the rough form of a deltoid.
- You can also move the vertexes of the bicep area to shape it.

### Arms 3 (Fig.50)

- Create 2 edge loops in the arm and forearm areas.
- Move the vertexes in order to roughly shape the bicep, triceps, elbow and forearm.

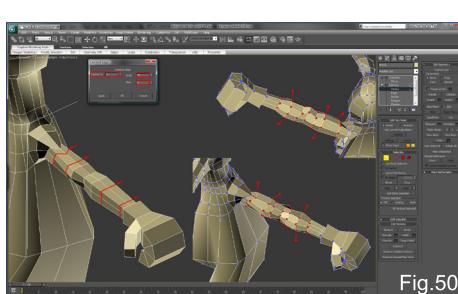


Fig.50

### Body 1 (Fig.51)

- Create one edge loop in the neck area, 2 edge loops around the belly area and another at the

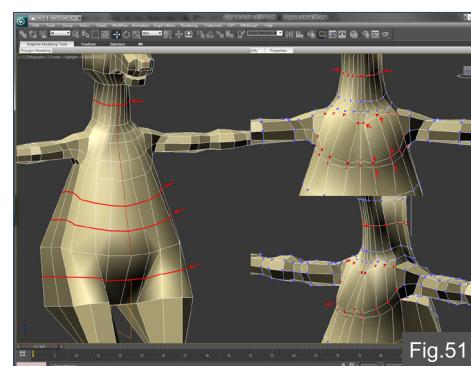


Fig.51

groin area. When creating the edge loop at the groin area, as there is a triangle you will have to manually create the edge splitting the triangle.

- Move the vertexes so that the edges form the pectoral muscles.
- Scale down the vertexes of the neck area slightly, so that the neck describes a slight curve between the head and the shoulders.

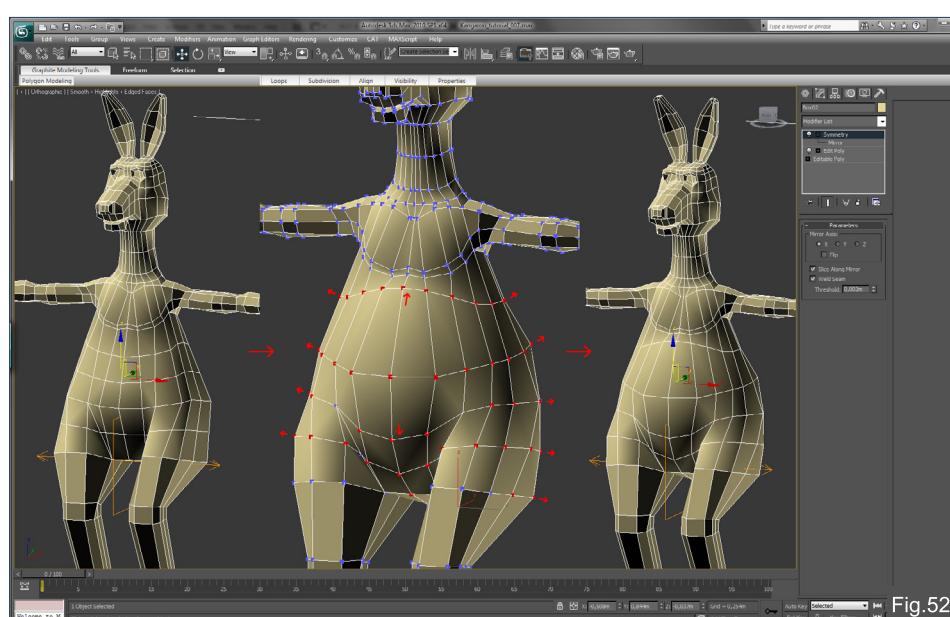


Fig.52

### Body 2 (Fig.52)

- Move the vertexes at the belly area to make it rounder.

# HOW TO STYLIZE AND MODEL 'TOON ANIMALS' Chapter 1 -Concept

3dcreative

## Body 3 (Fig.53)

- Create one edge loop at the thigh.
- Create 2 edge loops at the leg and feet.
- Move the vertexes to shape the heel and make the thighs bigger.
- In ZBrush we will have to continue fixing these proportions, later.

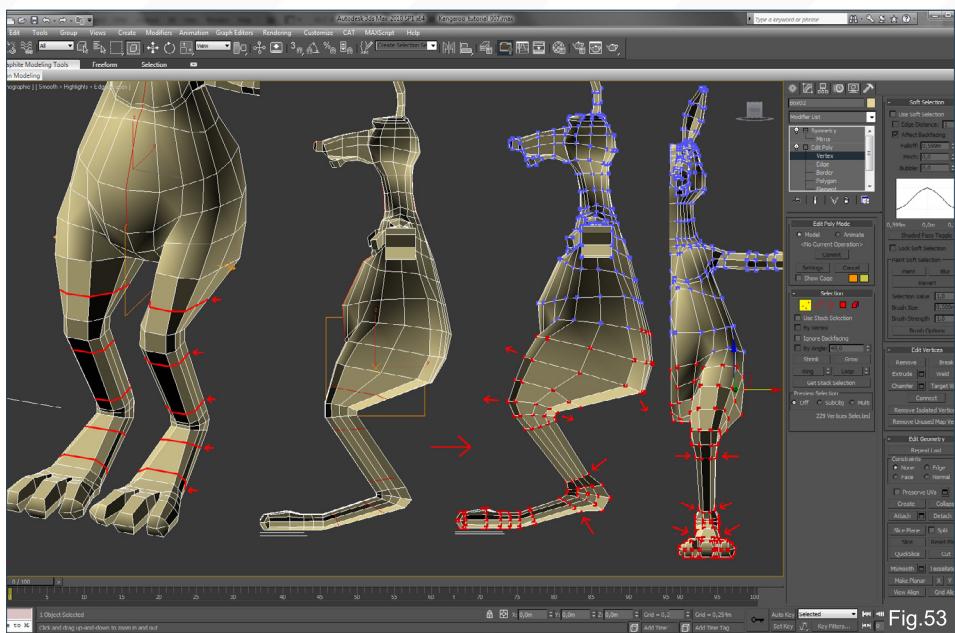


Fig.53

## Gloves1 (Fig.54)

- Select the glove element and scale it up a bit.
- Create 2 edge loops along the sides of the glove.
- Create 2 edge loops along the gloves.

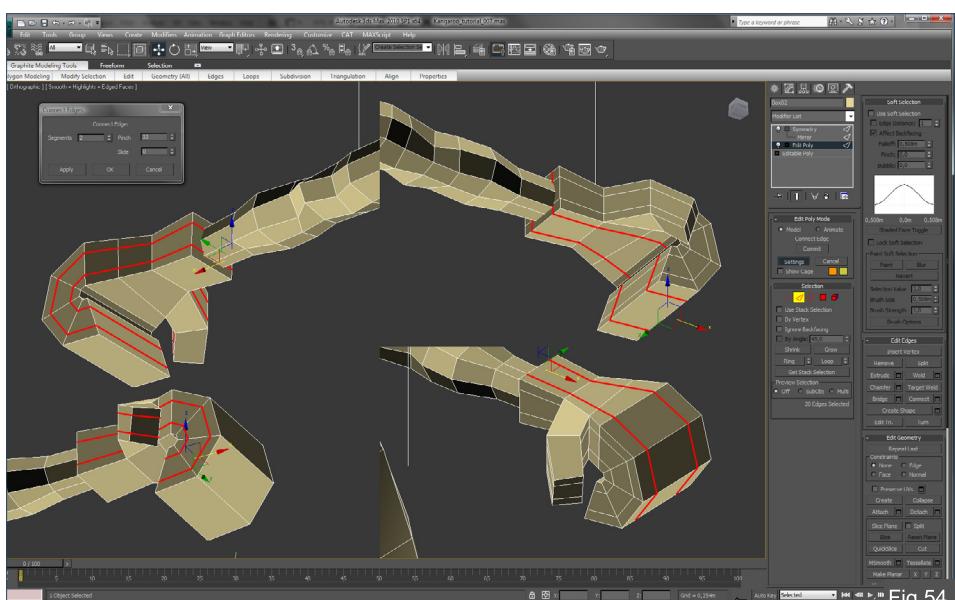


Fig.54

## Gloves2 (Fig.55)

- Move the vertexes of the glove to create a rounded volume.

## Gloves3 (Fig.56)

- Create edge loops at the wrist, connection of the thumb with the hand and tip of the thumb. The objective of these loops is to keep these areas in place when we subdivide them later in ZBrush.
- Scale up the vertexes at the wrist area of the glove to define it.

## Tail1 (Fig.57)

- Select the polygons at the lower back of the model.
- Use the Extrude dialog box, with an Extrusion Height of about 2.50m.

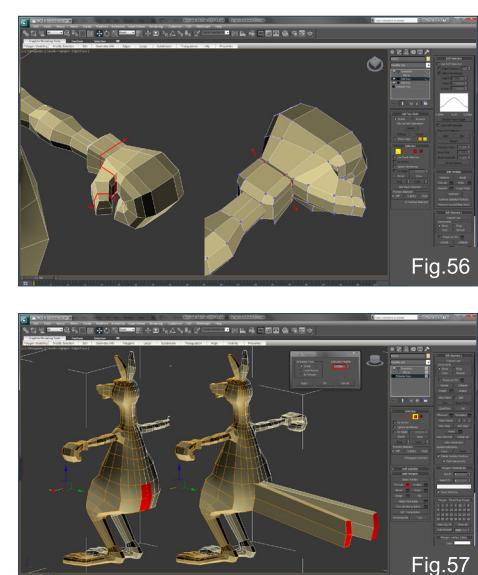
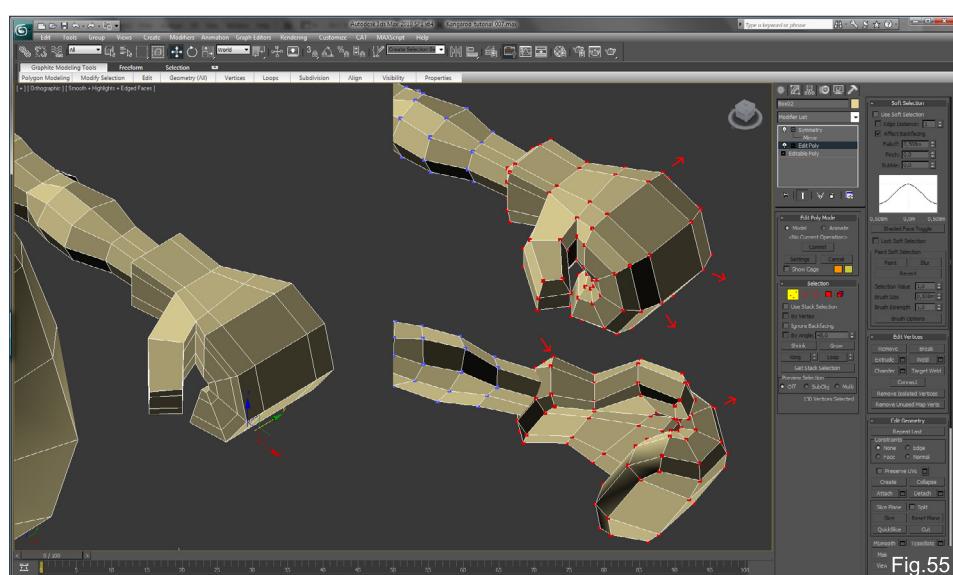


Fig.56

Fig.57

As the polygons are facing outwards you will notice that they will split as they extrude. We will move the end vertexes towards the mirror plane to weld together the 2 extrusions.

### Tail2 (Fig.58)

-Move the vertexes at the tip of the tail towards the symmetry plane and cross the vertexes to the other side of the plane. The Symmetry modifier will weld the vertexes.

-Move or Scale the vertexes at the tip of the tail to make it smaller.

-Move the vertexes that connect the tail to the body to make the tail profile rounder.

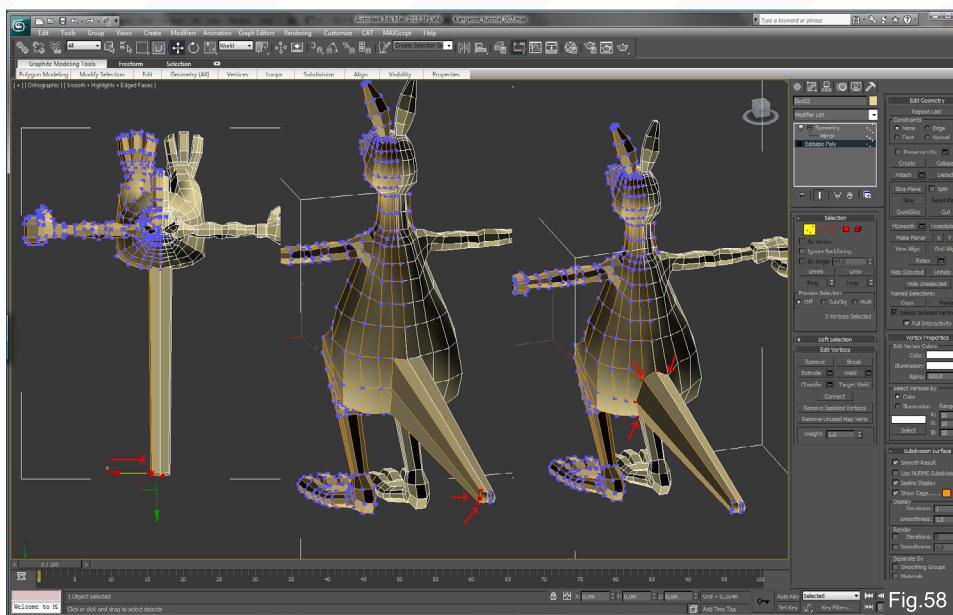


Fig.58

### Tail3 (Fig.59)

-Move the vertexes on the tip of the tail down until they touch the floor.

-Create 2 edge loops along the tail, one at the tail origin and another in the middle of the tail. You can make these edge loops by using the Quick Slice tool inside the Edit Poly Modifier. Use the Side View viewport, select the tail polygons, choose Quick slice and click above and below the tail, a clean cut will be made on the surface.

-Rotate and scale the 2 edge loops created on the tail to position it as shown in the figure.

keep the whole mesh more even in terms of subdivision (legs, feet, abdomen).

-Select all polygons.

-Click the Auto Smooth button inside the Smoothing Groups with a value of 90.

-Right Click on the Symmetry modifier and pick Collapse All to reduce the mesh to an editable poly.

-After collapsing, confirm that the mesh pivot is at the center of the mesh and at the coordinates 0.0.0. It is not strictly necessary, but a very good habit when modeling symmetrical meshes.

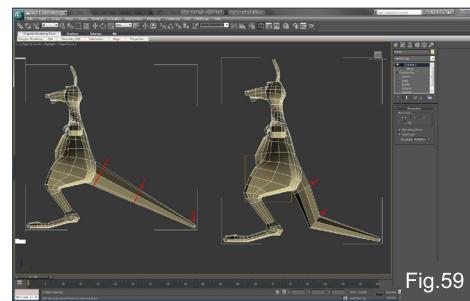


Fig.59

- Create a new Multi/Sub-Object material.
- Click the "Set Number" button and set the number of materials to 20.
- By clicking on the color swatch at the right of the material attribute a random color to each material. This will help you to identify the assigned Material Ids.
- Select the Polygon sub-objects referring to each different anatomical part of the character. Please follow the figure, be careful to separate the mouth from the head, the thumb from

### Tail4 (Fig.60)

-Create more edge loops along the tail in order to have an even distribution.

-Move the edge loops to have a nice curve on the tail.

-Create some more edge loops in order to

### Material IDs (Fig.61)

Now we will separate the mesh in different material Ids.

This will allow us to import the model into ZBrush and separate it in poly groups automatically.

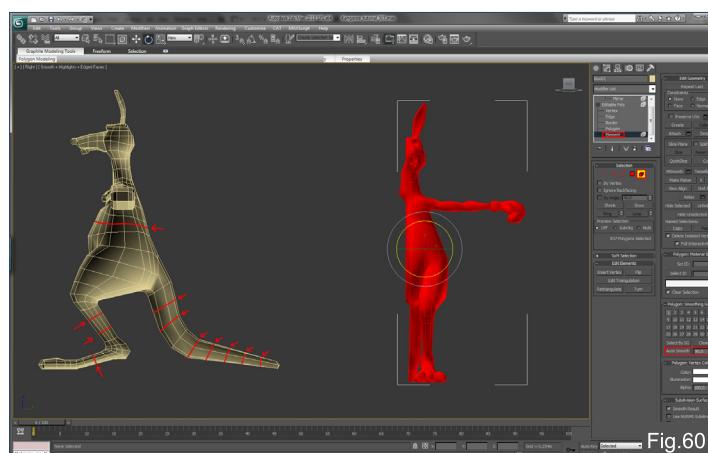


Fig.60



Fig.61

# HOW TO STYLIZE AND MODEL 'TOON ANIMALS' Chapter 1 -Concept

3dcreative

the glove and the feet from the toes. Select everything symmetrically, for example when you choose the left forearm also include the right forearm in the same material ID.

## Eyes1 (Fig.62)

-Create a sphere primitive with a radius of 0.06m and place it roughly at the eye socket.

## Eyes2 (Fig.63)

-If you wish to isolate the eye press Alt + Q  
 -Add an Edit Poly modifier and pick the polygons that represent the pupil. You can do this quickly by restricting the polygon selection to be "By Angle" with a value of 3.0 and clicking one of the pupil polygons.

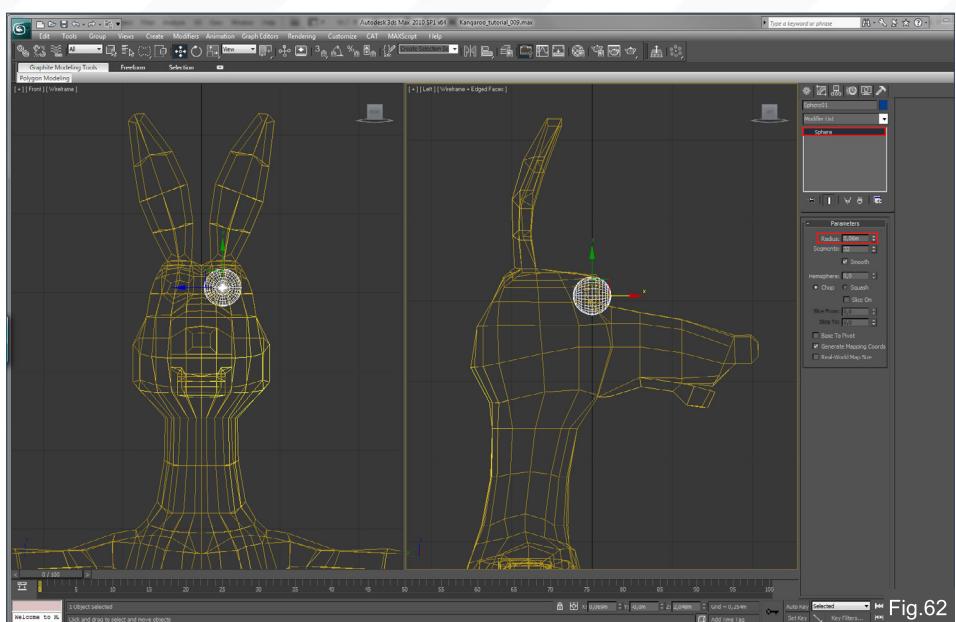


Fig.62

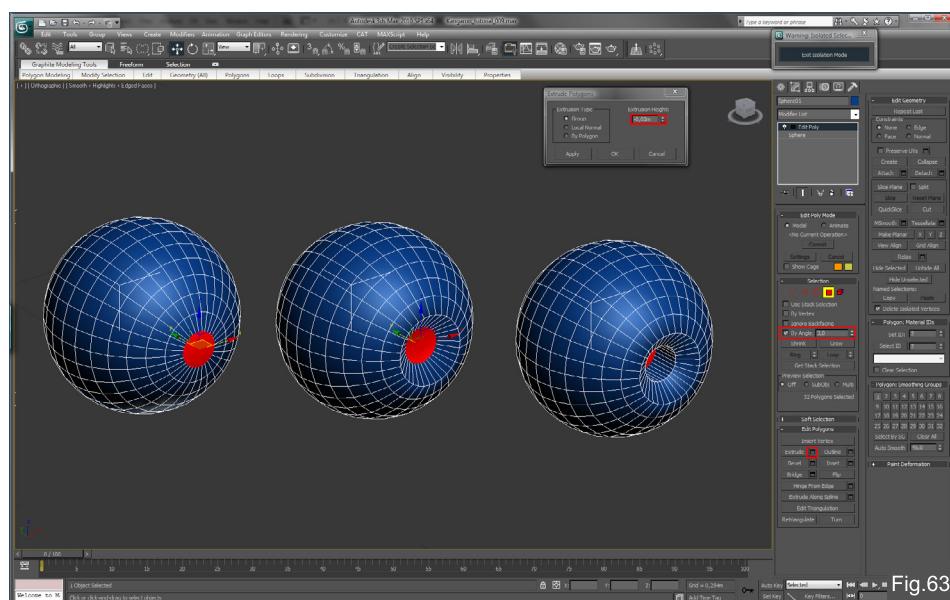


Fig.63

-Move the selected polygons inwards.

-Pick the Extrude Dialog box and set a value of -0.02m.

## Eyes3 (Fig.64)

Let's make the eye globes symmetrical in relation to the character mesh. This will ease the symmetrical editing in ZBrush.

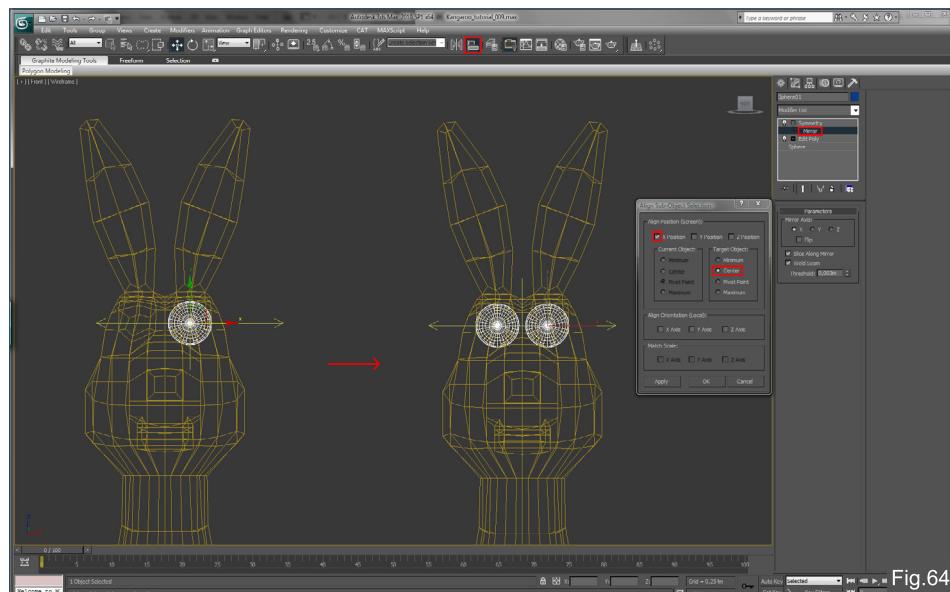


Fig.64

-If you have entered the Isolate mode, exit by clicking the "Exit Isolation Mode" button.

-Add Symmetry modifier to the eye.

-Inside the Symmetry modifier, select the mirror sub object.

-Click the Align button and pick the character body mesh.

-In the Align Dialog box choose the "X Position" and the "Center" of the Target Object.

-Choose "Apply".

## Export (Fig.65)

And now is the time to export our character to ZBrush.

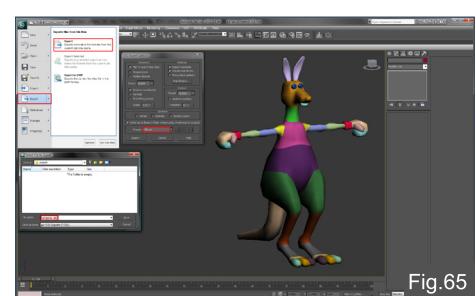


Fig.65

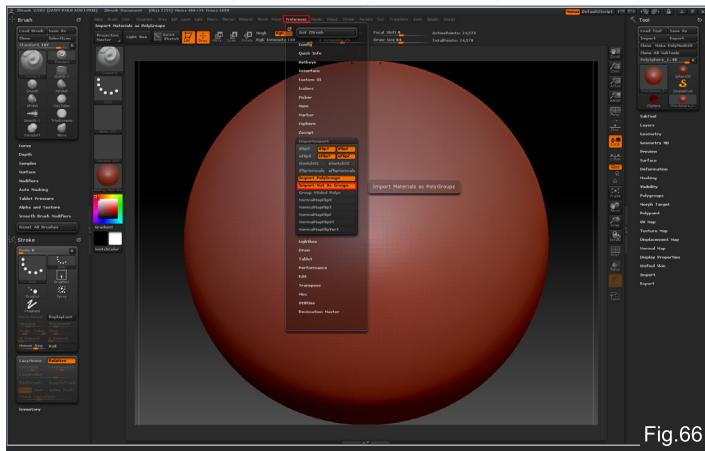


Fig.66

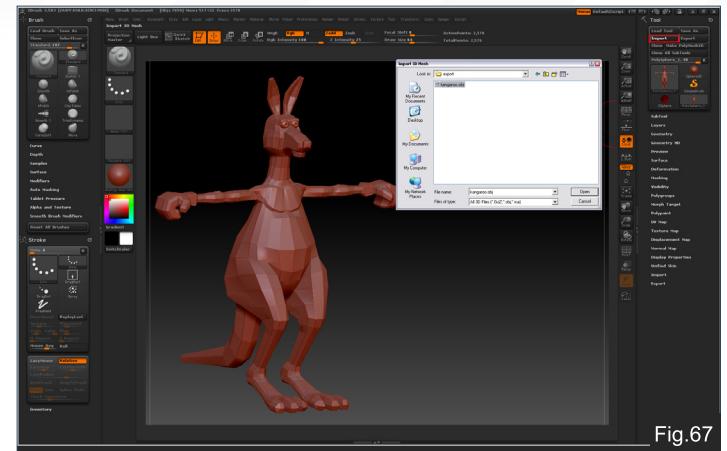


Fig.67

- Under the Export menu pick Export
- Choose a folder and save the file with the name kangaroo.obj in OBJ format.
- A dialog box with OBJ export options will pop up. Under "Preset" pick the ZBrush preset.
- Choose "Export".

#### Import into ZBrush 1 (Fig.66)

-Open ZBrush

NOTE: You will notice in the image that I have placed the Brush and Stroke menus on the left side of the screen and the Tool menu on the right. This is a layout that I feel comfortable with but you can use whatever suits you, you can

always find these menus on the top row.

- Go to the Preferences menu and under "Import Export" turn on "Import Mat As Groups".

This way ZBrush will create polygroups based on the material Ids we have set in 3DSMax.

#### Import into ZBrush 2 (Fig.67)

- Under the Tool menu choose "Import" and pick the kangaroo.obj file you have exported from 3DSMax

Now you should have the kangaroo model at the center of your screen.

#### Setting up 1 (Fig.68)

- If you activate the PolyF button on the right side bar (or press Shift + F) the polygroups will be displayed. You can confirm that all the polygroups are the same as the material Ids in 3DSMax.

Let's separate the eyes into a different sub tool so that the spheres don't get distorted while we deform the model.

- Open the Sub tool dropdown inside the Tool menu

- Press Shift + Ctrl (to activate the select mode) while left clicking on the eyes. Your eyes will be isolated and the rest of the mesh will be hidden.
- Inside the Sub tool menu click the "Split Hidden" button. This will place the body in a different sub tool.

#### Setting up 2 (Fig.69)

- You can hide the eyes, by choosing the body sub tool and clicking on the eye icon next to the eyes sub tool.

- Confirm that symmetry editing is on, by going to the Transform menu and making sure that "Activate Symmetry" is ON and the "X" axis selected.

#### Setting up 3 (Fig.70)

We will make all our editing on a new layer, so that we can always recover the original mesh.

- To create a new layer, go to the Layer dropdown under the Tool Menu and press the "New" button.

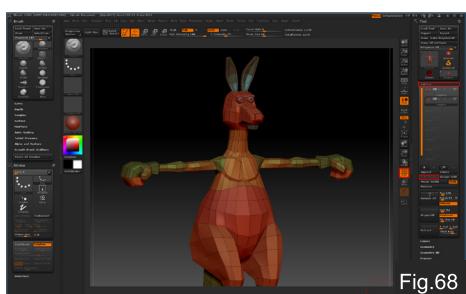


Fig.68

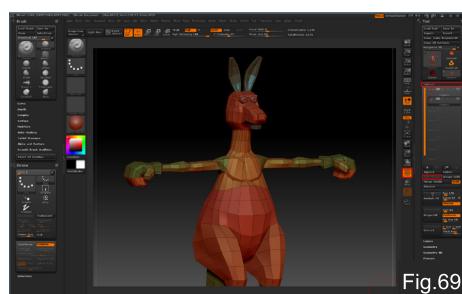


Fig.69

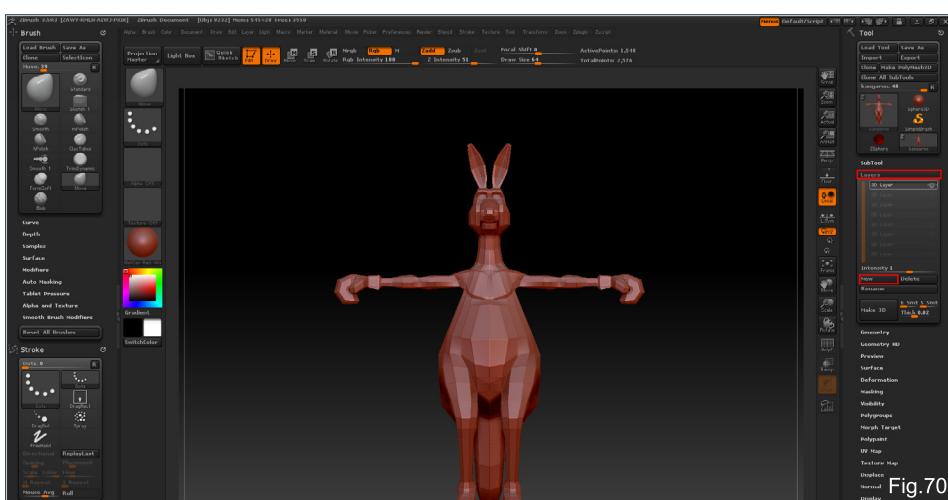


Fig.70

# HOW TO STYLIZE AND MODEL 'TOON ANIMALS' Chapter 1 -Concept

3dcreative

## Setting up 4 (Fig.71)

In order to pick the editing brushes in ZBrush you can press "B" on the keyboard and the palette with all the brushes will show up. If you press another letter, the brushes starting with that letter will be isolated. And if you press another letter (which is indicated next to the brush icon) that brush will be selected. Confusing? You will get used to it, don't worry. You can always pick the brush directly with a click under the Brush menu.

After you use a brush for the first time it will be stored in the Brush Menu (on the left side in my figure), so you can click in there if you prefer.

-Choose the Move Brush by selecting it on the Brush Menu (or by pressing "B" followed by "M" followed by "V")

## Reshaping 1 (Fig.72)

-In order to adjust the brush size press the "S" key and a "Draw Size" Slider pops up.  
-Slide the value and you will notice that the circle of the brush is adjusted. That represents the influence area of your brush. Note that the influence area is 3 Dimensional, corresponding to a sphere, not just a disc on a plane.

Now, all you have to do is click and drag on top of the model surface to pull it around.

Don't forget to keep orbiting around the object in order to understand what is happening in 3D

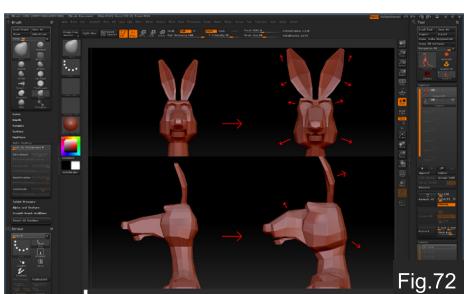


Fig.72

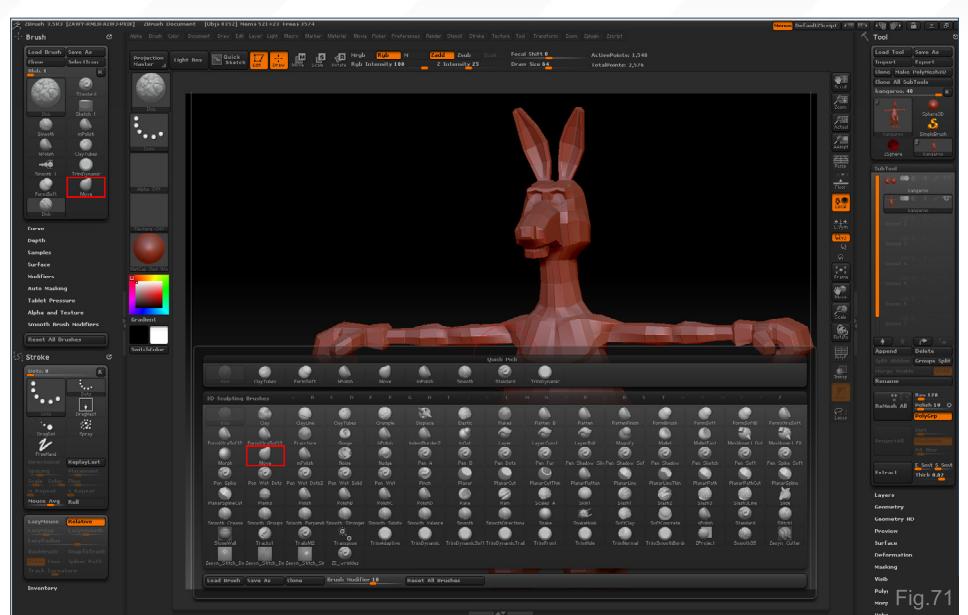


Fig.71

Space. To orbit around the object, just click and drag on the background.

-In the image you can see the deformations I have made in the head area only using the Move brush. If you want to move big areas increase the brush size. In case you want to move small areas, or even a single vertex, reduce the brush size so that the influence area is very small.

There is no right or wrong way at this stage. If the 3DSMax stage was about creating a good base, this stage is all about creative freedom and exploring. So, feel free to create a totally

different character from the one suggested in the images.

## Reshaping 2 (Fig.73)

I have decided to extend the neck and for that we will use the transpose tool.

-Mask the body area by creating a mask window that covers the lower body (press Ctrl and drag)

-Change from Edit mode to Move mode, by selecting the Move button on the top bar.

-Click and drag upwards at a point at the center of the body between the clavicles while holding the Shift key to keep the line vertical. You have just placed the Transpose tool. Click the Inner circle of the top circle and drag up, you will make the neck extend.

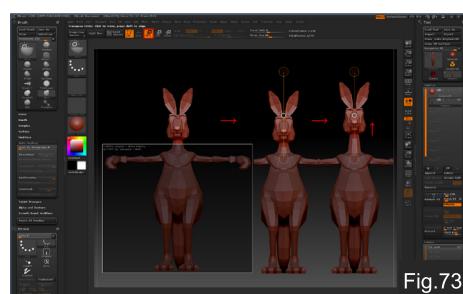


Fig.73

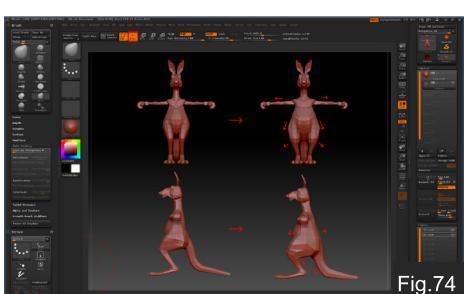


Fig.74

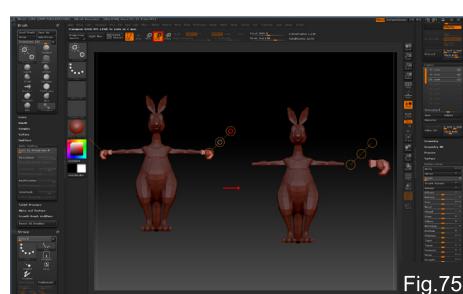


Fig.75

## Reshaping 3 (Fig.74)

-Press the Draw button at the top bar to go back to the editing mode with the brushes.

-Press Ctrl and drag at an empty area of the screen to clear the mask.

-Keep shaping the body with the Move Brush. I have made his lower body heavier and extended the arms.

## Reshaping 4 (Fig.75)

We will make the gloves bigger.

-Ctrl + Shift and click on the tip of the gloves. That polygroup will be isolated.

- Ctrl + Shift and click on the visible part of the model. It will invert the isolation and you will see everything except the tip of the gloves.
- Ctrl + Shift and click each of the remaining parts of the glove. The gloves will be hidden.
- Ctrl + Click on the background. It will mask the whole body with the exception of the gloves that are hidden.
- Ctrl + Shift and click on the background. You will unhide the gloves.

With everything masked with the exception of the gloves, let's scale them up.

ZBrush will scale according to the symmetry axis, so the gloves will scale out of place. We will reposition them after the scaling.

- Choose the "Scale" mode from the top bar.
- Click and drag starting on the glove and dragging outwards.
- Drag the inner circle of the outer handle until the glove is at the scale you desire.

#### Reshaping 5 (Fig.76)

- Choose the "Move" mode from the top bar.
- Rotate the view so that you see the model from top. While you click and drag on the background to orbit your model, if you press shift and drag the camera it will be positioned in alignment to the axis, and you are able to cycle through the Front, Top and Side views.
- Click and drag on one of the gloves to create the transpose tool.

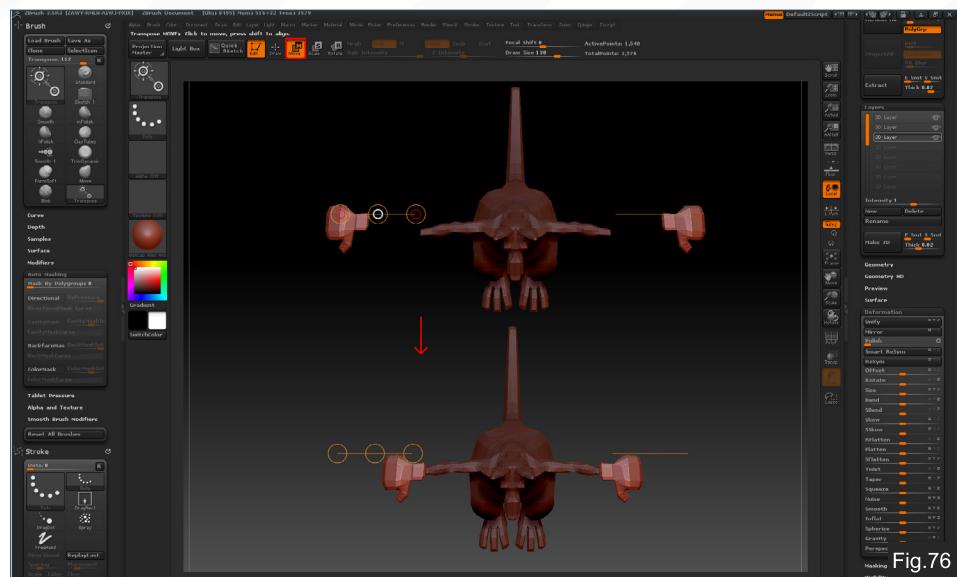


Fig.76

- Click and drag on the inner circle of the middle handle of the transpose tool to move the glove.
- Position it correctly in relation to the arm.

Rotate to the front view and verify if it needs to be repositioned vertically too.

#### Setting UVs 1 (Fig.77)

ZBrush might not seem the best place to UV map an object, but the UV Master plugin which you can download freely at Pixologic's website allows us to create continuous distortion free UV's in a very easy way.

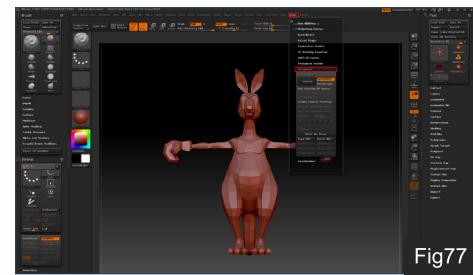


Fig.77

- Make sure that you have downloaded and installed the UV Master plugin according to the installing instructions.
- From the Zpluggin menu pick UV Master.

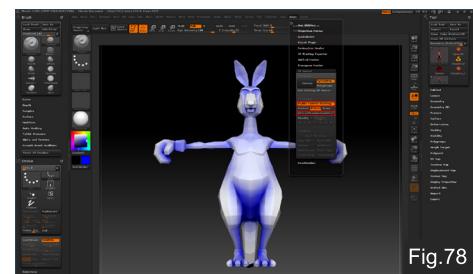


Fig.78

#### Setting UVs 2 (Fig.78)

UV Master will generate the UV seams automatically, but we can define which areas attract the seams and which areas will avoid them. We do this by painting 2 color codes on the mesh (blue to attract or red to protect).

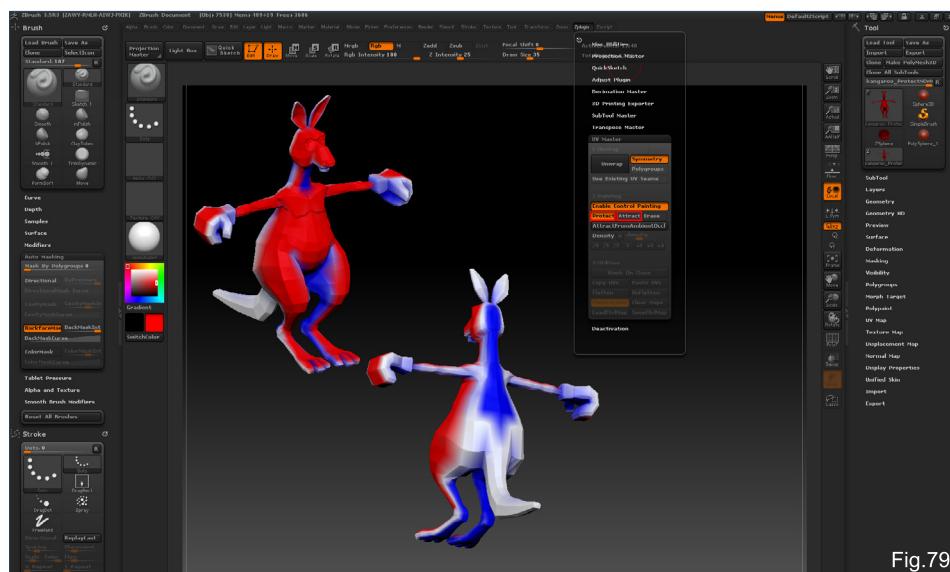


Fig.79

- Click on "Enable Control Painting". The material of your object will turn to white.
- Click "AttractFromAmbientOccl". This will paint in blue the most occluded areas of the model, therefore attracting the seams to hidden areas.

#### Setting UVs 3 (Fig.79)

- Click on the "Protect" button
- Paint directly on the model covering the areas to protect from seams. I have painted the face,

# HOW TO STYLIZE AND MODEL 'TOON ANIMALS' Chapter 1 -Concept

3dcreative

chest, thighs and the front of the gloves. ZBrush will try its best to avoid seams in these areas but they can still happen.

-Click on the "Attract" button and paint right below the mouth and the neck, also paint the back of the head, the back and under the feet. I have decided to attract the seams at the front of the neck and under the mouth so that the head can unwrap well. If you paint the whole head red, the snout's UVs will be too distorted.

## Setting UVs 4 (Fig.80)

-Click the "Unwrap" button. ZBrush will generate the UVs

-To check where the seams were placed click on "CheckSeams". If the result is not good click on the Protect or Attract buttons and keep painting to influence the result.

## Setting UVs 5 (Fig.81)

-You can see the unwrapped UV's by clicking the Flatten button.

-Click Unflatten to go back to the model.

-Click "Check Seams" again to remove them.

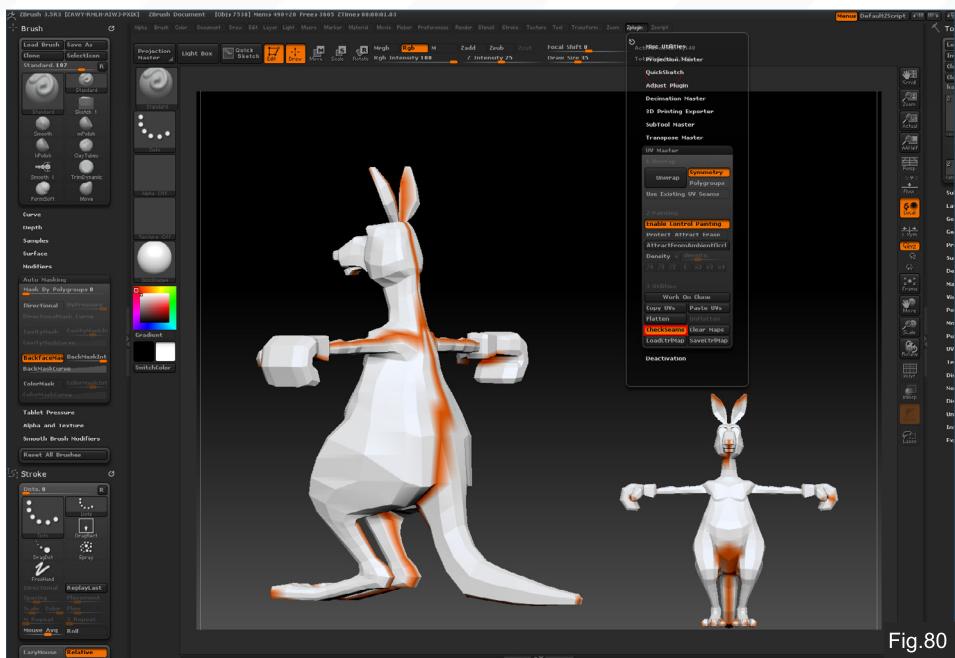


Fig.80

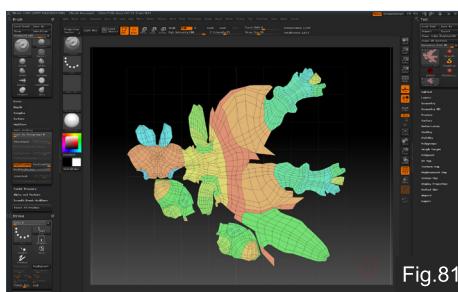


Fig.81



Fig.82

## MatCap (Fig.82)

In order to proceed sculpting I will pick a Material that helps to read the form well.

-Click on the Material slot and pick the "Reflect Yellow" Matcap.

-Using the "Move" and "Scale" mode with the transpose tool, position and scale the eyes.

-Select the body sub tool again and disable the "Transp" button.

-Press the "Divide" button once to subdivide the mesh.

## Eyes (Fig.83)

-Select the eyes subtool.

-Click on the "Transp" button on the right bar. It will make all the other sub tools transparent and it is easy to see the eyes and position them.

## Subdivide (Fig.84)

-In the Geometry pull down under the Tool menu, disable the "Smt" button. This will prevent the mesh from being smoothed when we subdivide it.

The idea behind subdividing the model without the Smooth option on is to preserve the volume of the model. We will sculpt the whole model and only subdivide it when the surface resolution doesn't hold any more detail. In the following subdivisions we will use the Smooth option.



Fig.83

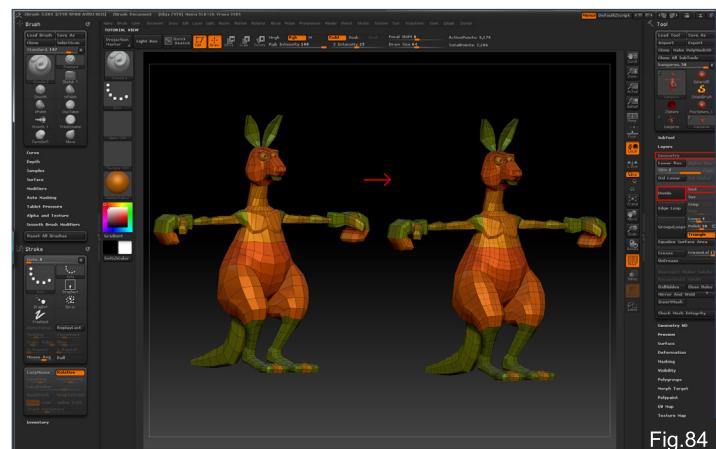


Fig.84

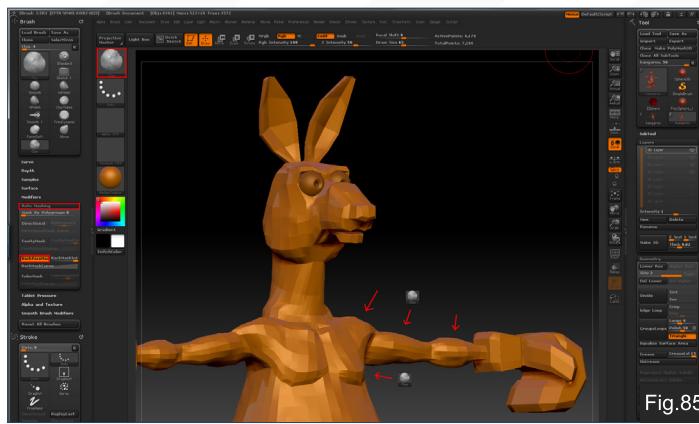


Fig.85

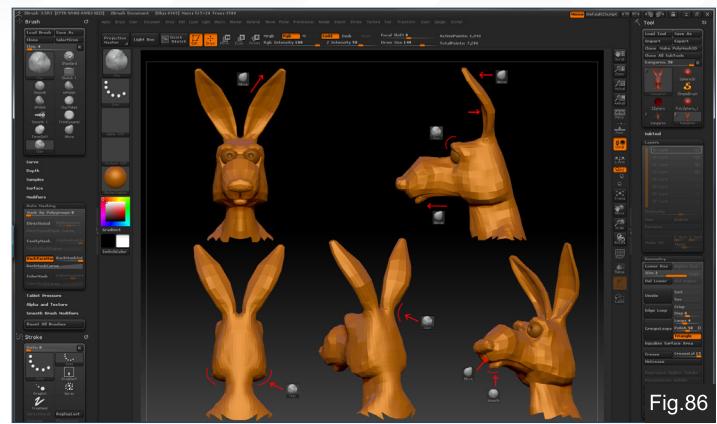


Fig.86

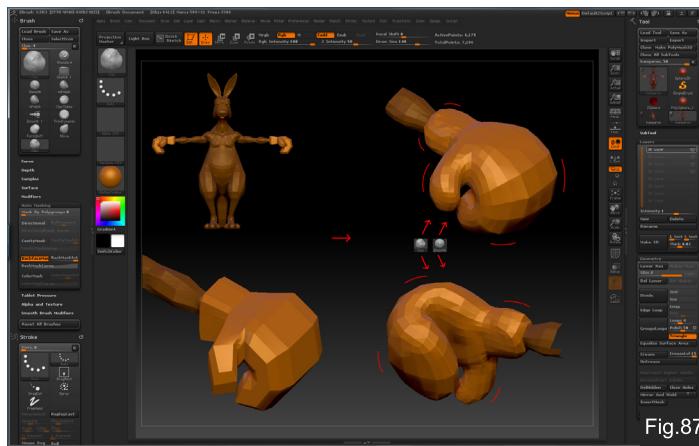


Fig.87



Fig.88

### Sculpting 1 (Fig.85)

We will use the "Clay" (Press B-C-L) and the "mPolish" (Press B-M-P) brushes for most of the sculpting.

The Clay brush adds material to the model by filling the holes first, like real clay. To reduce the volume, press the Alt key while using the brushes.

The mPolish brush acts like polish and it can be used to soften the surfaces, round corners or sharpen edges. Think of it as real polish, if you start sanding a corner it will get rounder and smoother, however if you sand the surfaces that lead to the corner you can sharpen the corner.

Very handy!

Basically, we will add material with the Clay brush and smooth it and refine it with the Mpolish brush. You can also use the "Smooth" brush by pressing Shift while using any of the brushes to smooth the surface or use the "Move" brush to move parts of the model.

-Start by using the Clay Brush to define the muscles of the character.

-In the Brush menu, inside the Auto Masking pull down enable the "BackFaceMask" button. This will prevent the brush from affecting the surfaces that are not facing the camera.

### Sculpting 2 (Fig.86)

I have extended the ears and the snout by using the Move brush.

The eyebrows were pulled to the front using the Move brush and were thickened using the Clay brush, in order to cover the top of the eyes. The Clay brush was used to soften the transition between the head and the ears and add weight to the cheeks.

Don't forget to mark the seam below the nose by moving the surface in.

### Sculpting 3 (Fig.87)

-Mask the model with the exception of the gloves (like we did before).

-Smooth and add volume to the gloves using the Clay brush and the Smooth brush. In order to have better access to the interior of the glove you can isolate the different parts of the glove by

clicking with Ctrl + Shift on each of these parts.

### Sculpting 4 (Fig.88)

-Using the Clay and Smooth brushes make the tail, the belly and the thighs smoother.

-With the Clay brush mark the bony areas at the ankle and lower leg, adding and subtracting to the surface.

-Make the fingers on the feet rounder with the Clay and Smooth brushes. In order to work on the areas between fingers, hide each of the fingers by clicking on them with the Ctrl + Shift keys pressed.

### Sculpting 5 (Fig.89)

-In the Tool menu, inside the Geometry pull down, press the "Smt" button to turn on the



Fig.89

# HOW TO STYLIZE AND MODEL 'TOON ANIMALS' Chapter 1 -Concept

3dcreative

smooth option when subdividing the model.

-Press the "Divide" button to add one

subdivision level.

-In order to isolate the head you can press Ctrl + Shift and drag a window over the head area.

With a new subdivision level we can start adding more detail. As I had mentioned at the beginning of the tutorial, Stylization and Silhouette are a must for a cartoon character. We will take advantage of the extra resolution on the mesh to explore this.

I have only used the Clay, Smooth, Move and mPolish brushes.

The mPolish brush was extensively used to create sharper angles and more defined planes on the surface contributing to the contrast between light and dark areas.

In the image you can see that I have tried to create some graphic lines on the geometry. In blue I have marked the flow of the main planes and how they contrast with each other, contributing to a strong silhouette. In order to achieve these planes I have started by adding some material with the Clay brush and then sand it with the mPolish brush to remove the excessive material and make the surface uniform. The snout was extended a little further with the Move brush.

## Sculpting 6 (Fig.90)

The same logic was applied to the rest of the body. I have marked in blue the intentional geometric lines that can be felt in the character's silhouette.

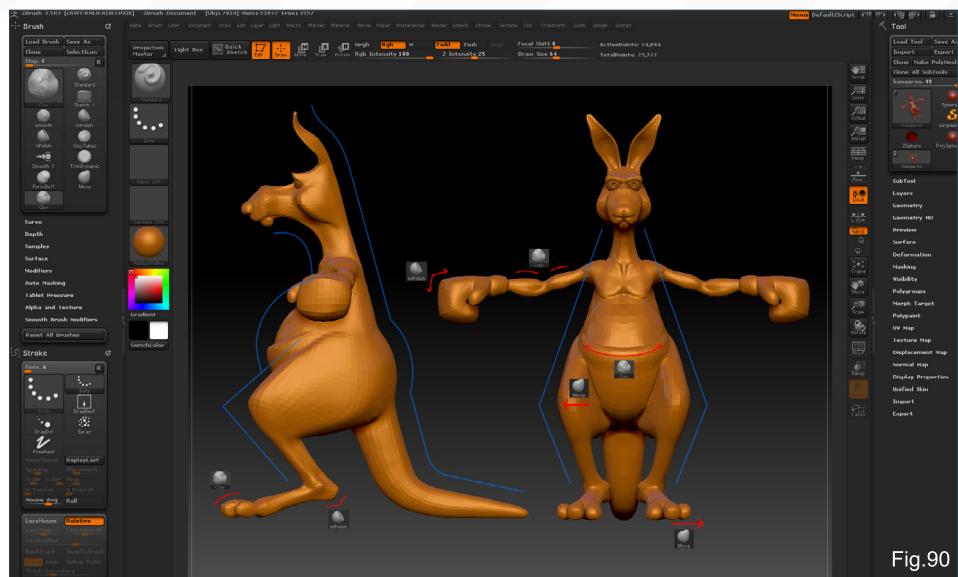


Fig.90

The muscles on the arms and chest were defined with the Clay brush.

The Move brush was used to put the elbows and knees in a more natural position.

The mPolish brush was used to make the gloves, knees and heels a bit more angular. With the Clay brush I have marked the marsupial pouch trying to follow the existing polygons in the belly area and then used the Move brush to create a slight curve, lower at the center of the body.

## Sculpting 7 (Fig.91)

-Create another subdivision level by pressing "Divide" under the Geometry pull down and keep adding detail.

I have used the same brushes as before and also the Pinch brush.

The Pinch brush allows us to attract geometry to our brush stroke which is great for sharpening creases and corners. When sharpening convex creases, press the Alt key with the Pinch brush.

The mPolish brush was used to make the ears look more pointed.

The Clay brush was used to create the Adam's apple at the neck and to further define the pectoral and arm's muscles.

The Pinch brush was used to define the muscle's intersections and the division at the wrist area of the glove.

This subdivision level already allowed started creating some folds on the boxing gloves, which were created with the Clay brush.

## Sculpting 8 (Fig.92)

On the lower body, the Pinch brush was used to sharpen the transition between the thigh and the belly as well as the marsupial pouch. Use a small sized brush while doing this so that it doesn't influence a big area.

The Clay brush was used to add wrinkles on the back of the knee, front of the feet and to the connection between the tail and the body.



Fig.91

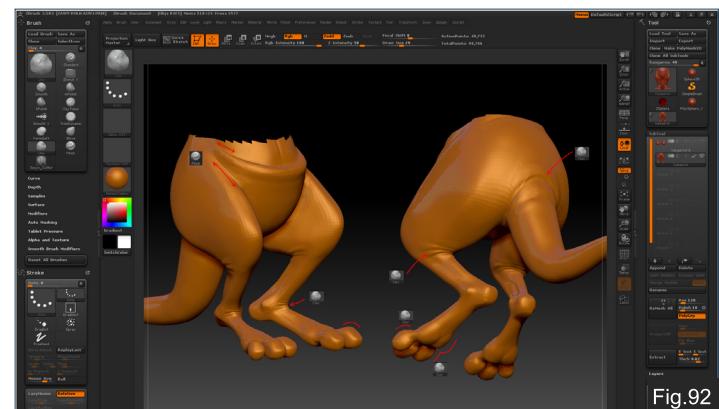


Fig.92

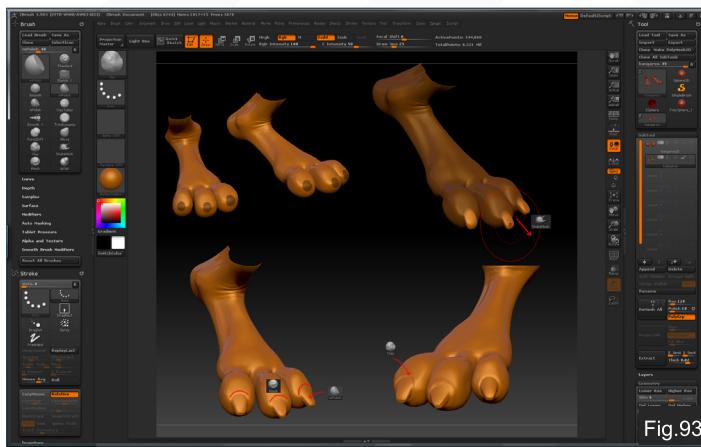


Fig.93

The underside of the feet were also padded with the clay brush. The mPolish brush was used on the top of the toes to add more angularity. As you can notice, these details don't change the overall geometric volume of the character. The intention is to create a secondary point of interest.

### Sculpting 9 (Fig.93)

The base is set. We can now start adding the minor details.

-Subdivide the geometry 2 more times. The geometry should have around 6 million polygons now.

-Isolate the feet by pressing **Ctrl + Shift** and dragging a window covering both feet. With a lot of polygons it is more comfortable to isolate the areas we are working on.

-Press **Ctrl** and paint a mask on the toes to mark the area where the nails will grow from.

- Invert the mask selection pressing **Ctrl** and clicking on the background area.
- Select the **SnakeHook** brush and from a Top view pull the nails out with a stroke.
- Press **Ctrl** and drag on the background to clear the mask.
- Use the **Pinch** brush to sharpen the transition between the toe and the nail.
- Use the **mPolish** brush to flatten the nails on top.
- With the **Clay** brush inflate the area around the nails to create a more believable connection between the nail and toe.

### Sculpting 10 (Fig.94)

- Isolate the boxing gloves.
- With the **Clay** brush and pressing the **Alt** key, make a hole at the base of the gloves.
- Use the **Pinch** and **Clay** brushes to enhance the folds.



Fig.94

-Back on the main model use the **Pinch** brush to define the muscles, and the **Clay** brush together with the **Smooth** brush to build the muscle masses.

### Sculpting 11 (Fig.95)

- Isolate the head.
- Use the **Clay** brush to feel the cheeks.
- Hide the eyes or make them transparent and create the upper eye lid with the **Clay** brush.
- You can mark the upper and lower lids with the **Pinch** brush.
- With the **Clay** brush I have added a few dots at the snout to suggest some detail.

### Sculpting 12 (Fig.96)

- A few more wrinkles were added with the **Clay** Brush.
- Add as many little details as you wish!

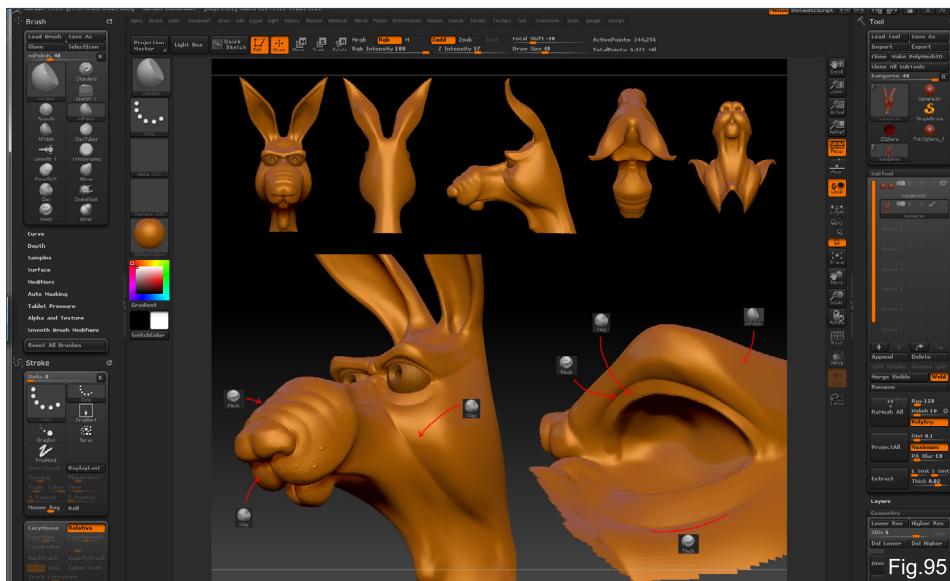


Fig.95



Fig.96



Fig.97



Finished T-Pose (**Fig.97**)

We have finalized the sculpting of the character in a T-Pose. In the image you can see how the mesh looks from different angles.

In the next Chapter we will learn how to pose the character and create his textures. See you in the next Chapter! (**Fig.98**)

JOSE ALVES DA SILVA

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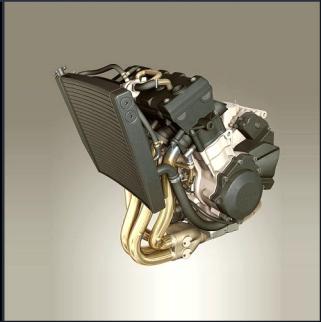
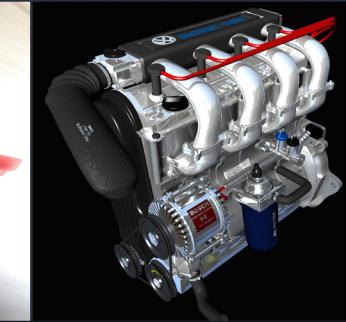
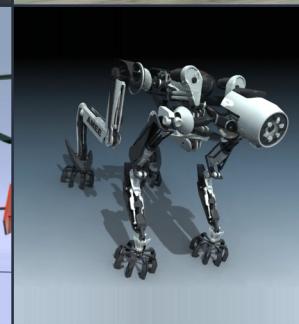
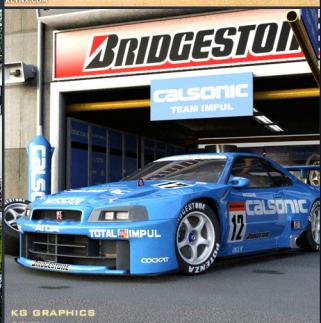
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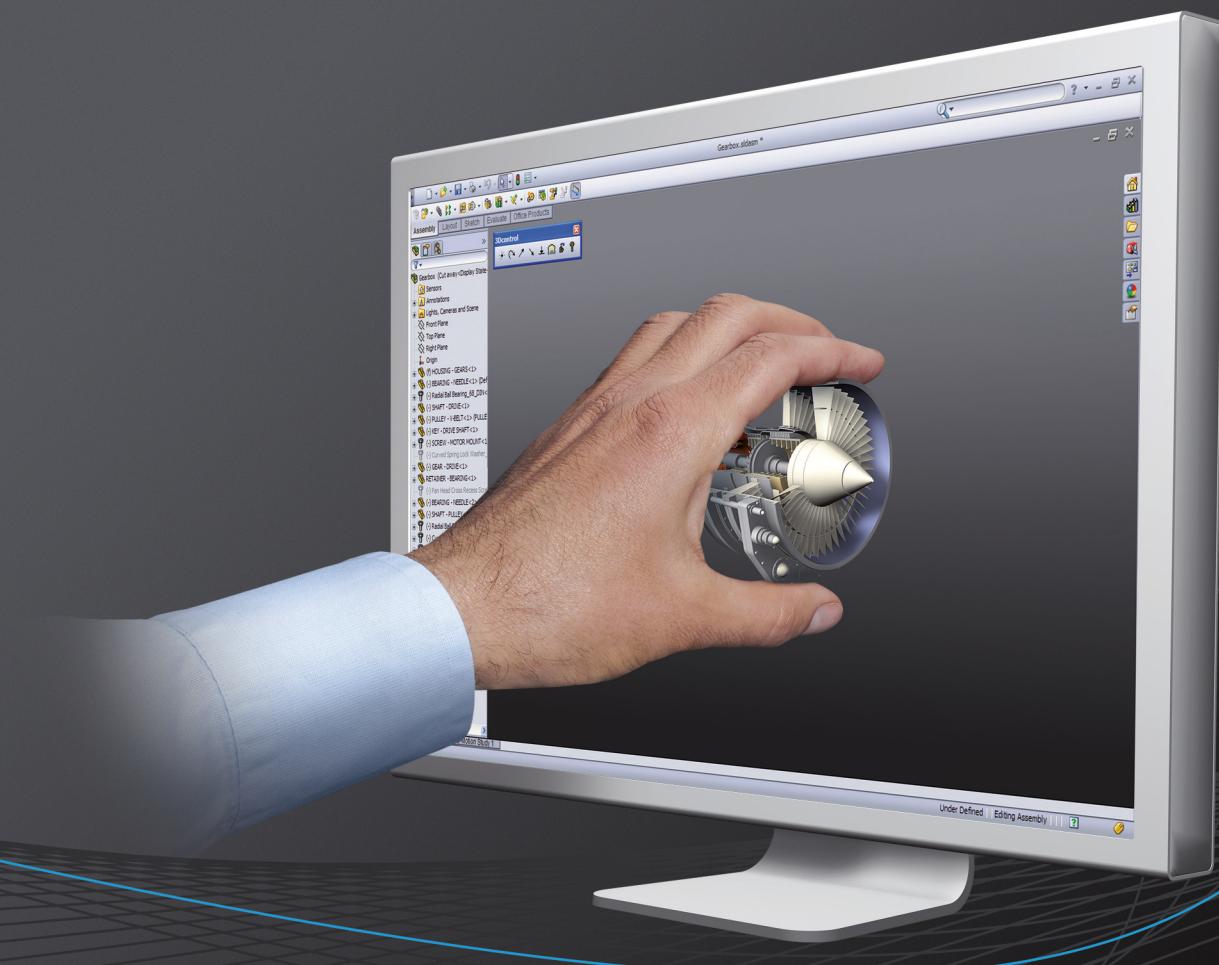


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# MUDBOX

## FEMALE CHARACTER CREATION

Welcome to Mudbox female character creation with Wayne Robson. This series will be providing a comprehensive guide to sculpting female characters using Mudbox. Wayne Robson will talk us through identifying the characteristics that define what is unique in each of our female characters, and will then give advice about sculpting these using many of the features that are available when using Mudbox.

CHAPTER 1 | MAY ISSUE 056  
Gaunt / Old

CHAPTER 2 | THIS ISSUE  
Obese

CHAPTER 3 | NEXT ISSUE  
Extreme Piercings & Tattoos

CHAPTER 4 | AUGUST ISSUE 060  
Zombie

CHAPTER 5 | SEPTEMBER ISSUE 061  
Vampire

CHAPTER 6 | OCTOBER ISSUE 062  
Werewolf

## CHAPTER 2 - OBESE

Software Used: Mudbox

## INTRODUCTION

(Fig.00) I thought for the second model in this series we'd go for something a bit different and aim it more in the classical sculpture realm. My reasons behind this are simple as it happens; this allows us to concentrate more on the forms and shapes behind the sculpture itself. We can't hide behind a texture with this sculpt! Also I would advise you to look at as many classical /traditional sculptures and busts as you can. I have a very large collection of reference photos I've taken myself at museums around the world on my travels that are invaluable. (Fig.A – Fig.I)



Fig.A

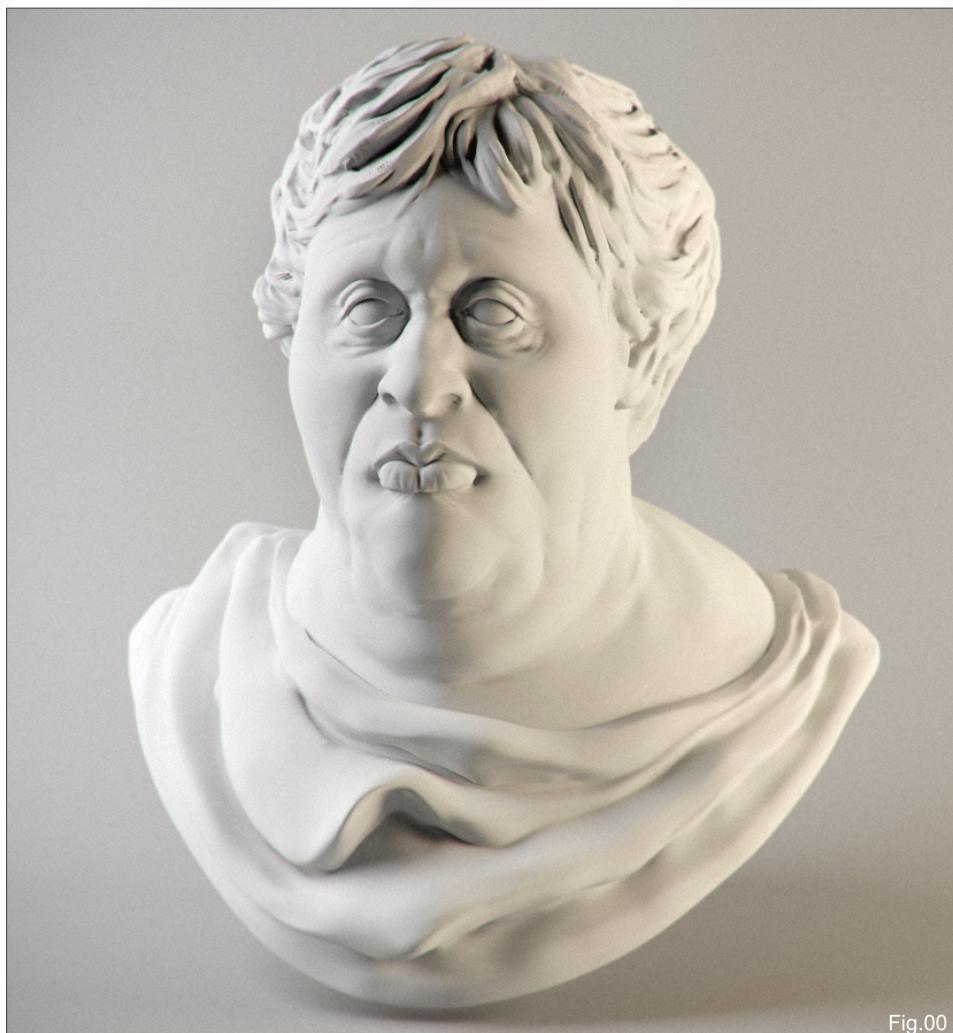


Fig.00



Fig.B



Fig.C



Fig.D



Fig.E

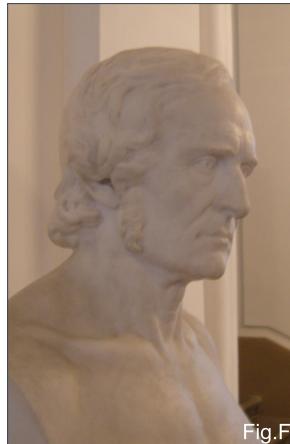


Fig.F



Fig.G



Fig.H



Fig.I

due to marble not being very easy to sculpt, so using the minimum amount of detail is a must if you are to replicate a classic look.

## FEATURES OF AN OVERWEIGHT FACE

Talking about overweight people is a bit of a minefield, but as I'm currently overweight I don't think we'll have a problem. As with any sculpt observation is the key, along with finding ways to interpret the information that you are seeing into a format you can then use to sculpt a model. For this model we will once again be using the Mudbox Default head base mesh along with 2 sphere's for the eyes and a simple piece of geometry for the cloth area. As opposed to the entire sculpting process, this time around I've concentrated on parts that many of you will have trouble with, in an attempt to help you be more at ease sculpting them. There is one 'Elephant in the room' that is rarely mentioned when sculpting an overweight woman. It's the secret that no-one dares speak of, and one that can play a big part in your sculpt. Often overweight women can look very male. Once you take away the makeup and hair, it can be far harder to tell them apart from a man. If you were to remove the skin colour then it would get harder still. So how do we solve this little dilemma? My solution was to add a draped cloth. I kept the hair pretty messy on purpose as I'm a big believer in sculpting 'real people' as

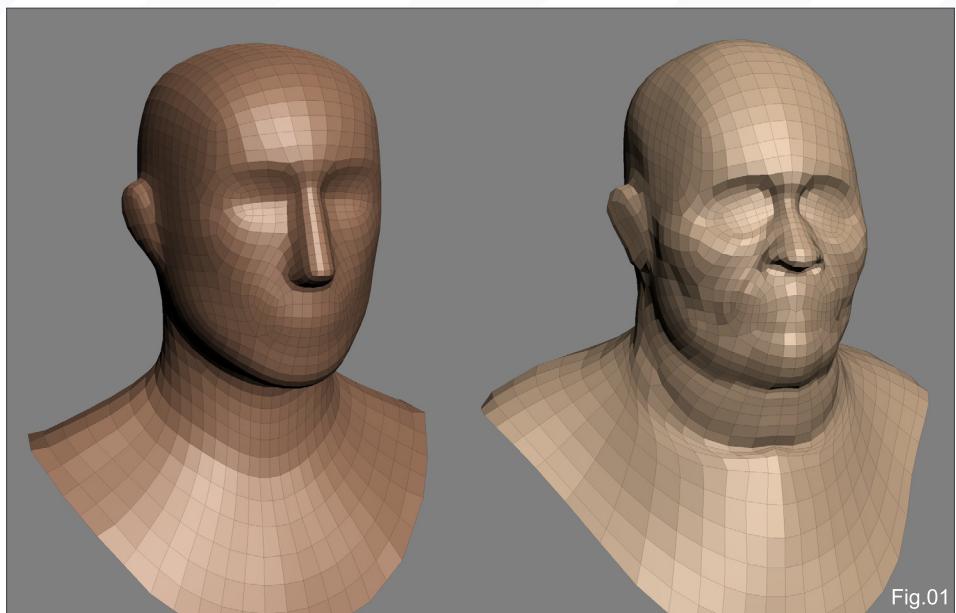


Fig.01

opposed to a stereotypical version. (Well most days anyway.) Plus overly complex hair at this stage would require a whole article on its own! People, whether fat, thin or in between all share the same basic skull structure underneath, they share the same muscles but the layer of fat differs. There are a few things that we can immediately notice on a person that is overweight. Firstly the eyes will appear smaller due to the layer of fat making the face itself look larger and far more rounded. There will be less noticeable bony areas and areas such as the cheeks will be plumper. But overall we must bear in mind that they will still follow anatomical guidelines, so the head must be able to contain a skull that is proportionate.

troublesome to sculptors. So as well as covering how to sculpt a believable human eye, we'll also touch on sculpting hair (one way of many) and also touch on sculpting cloth. Even though the geometry used is just the default head base, a couple of spheres and a very basic mesh for the cloth I've supplied it for those who may have problems in the early stages. As I said last time the greatest gift you have as an artist is your eye. You can often fall into a trap when starting to sculpt what you believe is there as opposed to what is really there. Take nothing for granted and examine the relationships between each features main (large) forms and how they interplay together. (Fig.02)



Fig.02

An often overlooked anatomical guide for face shapes are the subject's teeth. The entire area below the nose is shaped to a large degree by the teeth and how they grow. For an extreme example of how a face can change do a Google for 'gurning' (often done by people with no teeth, it helps to illustrate to what degree our teeth play a part in making us look like we do).

## SCULPTING OUR MAIN FORMS

(Fig.01) This time around I'll be putting fewer explanations into the basics we covered last time, and more into sections that often prove

Our first job is to nail the main shape of the face, neck and shoulders at as low a poly count as we can. The reason behind this is so that the result is often far smoother than just whacking away sculpting at a higher level. Now this is NOT a law set in stone, it is however a guideline that makes a lot of sense especially when you're starting out as a digital sculptor. But it's also one you can disregard as you progress and your skill levels improve. But let's consider it 'best practice' for sculpting to make the full use of each and every sculpting level. While I am not a great lover of 'artistic rules', I do believe that artistic guidelines are a good idea to keep in

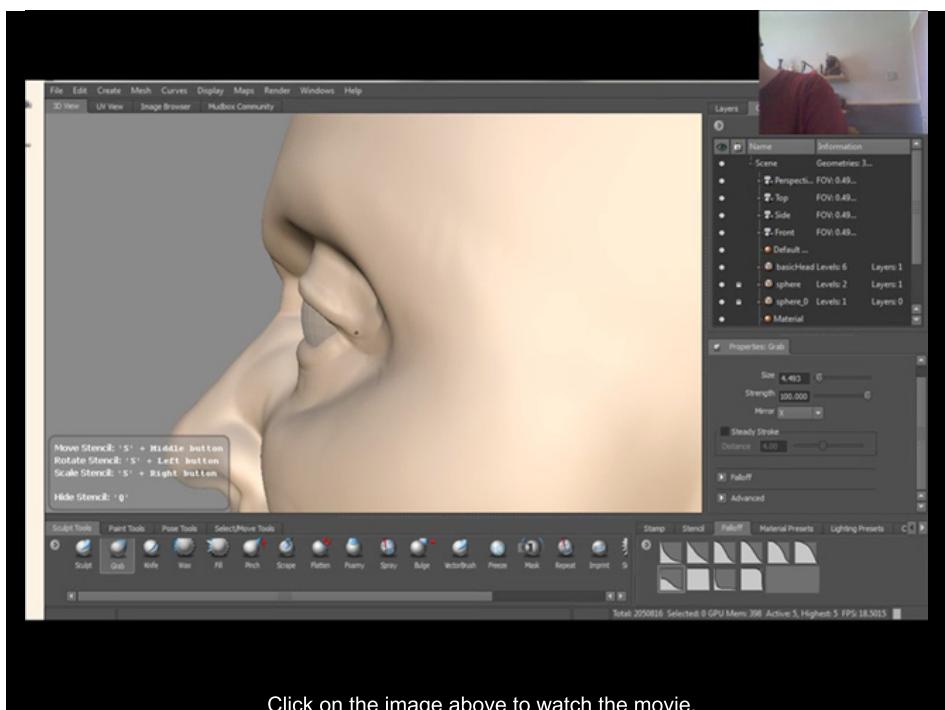
your mind, for example If a sign imposed a rule such as 'do no walk on the grass', you can be sure someone would. However if I suggested it may not be great idea to walk on the grass as it contained a minefield chances are you'd take a wide berth of the grass.

At this stage forget the eyes, as at this early stage they are rather unimportant to be frank. The same goes for the mouth and ears, you

are concentrating on the head, neck and upper body shape only. Take as long as you need and remember as with our last project to always keep reference on hand to refer to regularly. Keep things looking smooth and not lumpy in any way as our aim is a smooth looking classical sculpt. The old masters would go to great pain to ensure their marble sculptures were as smooth as possible. If you have ever had a chance to touch one, as I was lucky enough to last year,



Click on the image above to watch the movie.



Click on the image above to watch the movie.



Fig.03

then you will immediately see what I mean. I should point out that I wasn't supposed to touch them at the Hofburg palace in Vienna, and yes lots of angry Austrian security guards did come running towards me for a 'chat'. No one ever said art was safe though lol.

As we will be adding a draped cloth to the sculpt I've not gone overboard with the details on the body itself, as it won't be seen. I did however try to ensure that the forms were correct as you must have something believable for the cloth to drape over.

## THE EYES

(**Fig.03**) Eyes are usually one of the 'big three' problem areas for many digital sculptors when sculpting the human face. (The others in case you're interested are the ears and mouth). The eyes it has been said many times, are the window to the soul, and it is the one area that can kill an otherwise excellent sculpt stone dead. I've provided a video that covers the eyes in a bit more depth than this article can do.

The biggest things to remember for the eyes are that:

- The eye is round (although not a perfect sphere), and the lids should wrap believably around it.
- Eye lids are very thick. Take however thick you think they are...then at least double it. This is exaggerated more in classical style sculptures to catch a nice shadow.

- In a classical style sculpt you aren't going to be able to sculpt in each eyelash, so you need to make the illusions of them using light and cast shadows. (This is one of the many reasons the great masters often sculpted a piece to be seen in certain lighting and places.)
- Often eyelids do not require masses of 'crease' detail. You'll find that in many cases a small smattering will more than suffice.

## THE HAIR

**(Fig.04)** My one biggest tip before sculpting hair is to make sure that you are sculpting on a backup copy of your Mudbox scene file. My second tip is to send a screenshot out to Photoshop and to test a few very broad strokes as to what sort of hairstyle fits your character. Just like real people, not every hairstyle will suit every sculpture (no matter how well done). So you must give her a hairstyle that a woman would have herself to try and look the best she can.

Sculpting hair is really no different a process than painting it in Photoshop as we did in the last article. DO NOT get caught up in the details, the earlier on in the process you are the broader and bigger your strokes can be. The initial strokes (a wax brush with a long flat stamp works well for this) should help to define the direction of the hair and it's mass. Ideally you should be able to 'feel' the hair with very low detail. This is often easier to achieve with



Fig.04

longer hair than short, as longer hair has a more gestural feel to it. **(Fig.05)**

Once you have your mass, then start sculpting in dark shadow areas. WOAH! Wait a minute Wayne! What are you on about sculpting shadows?" I hear you shout. The single biggest tip I can give anyone about digital sculpting is this very simple phrase I will quantify in a second:

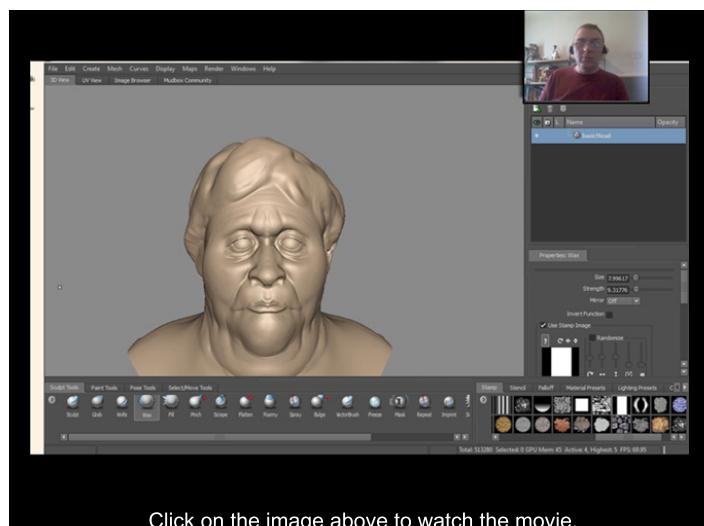
**"YOU ARE NOT SCULPTING POLYGONS  
...FORGET THEM... YOU ARE SCULPTING  
WITH LIGHT, SHADE AND SPECULARITY"**

Polygons are a man made construct to arrange the somewhat complex notion of forms and

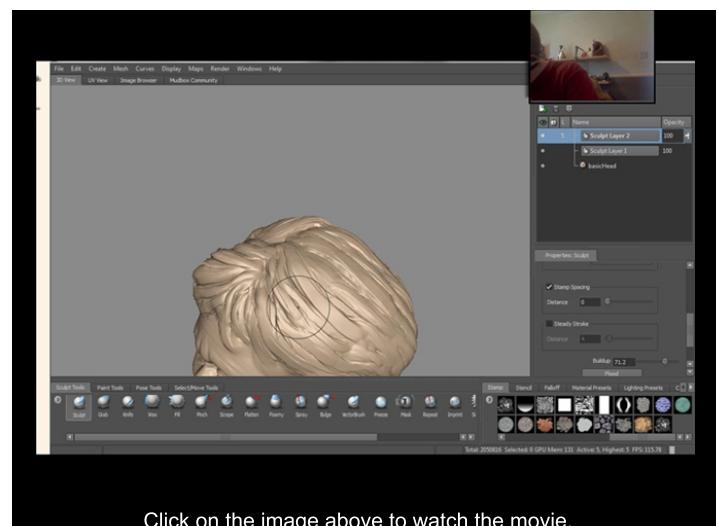


Fig.05

shapes in a digital sculpting program such as those we use. As such they when a material is added show lighting information such as shadows, surface type etc. Once you forget all about polygons and just concentrate on your purest forms you will find life is not only easier, but that your skills are far more portable across different application and mediums. The above sentence is something I've said at every masterclass, workshop and training I've ever given and just about every one of my DVD's. Yes while topology is important, make it your slave, not you its slave.



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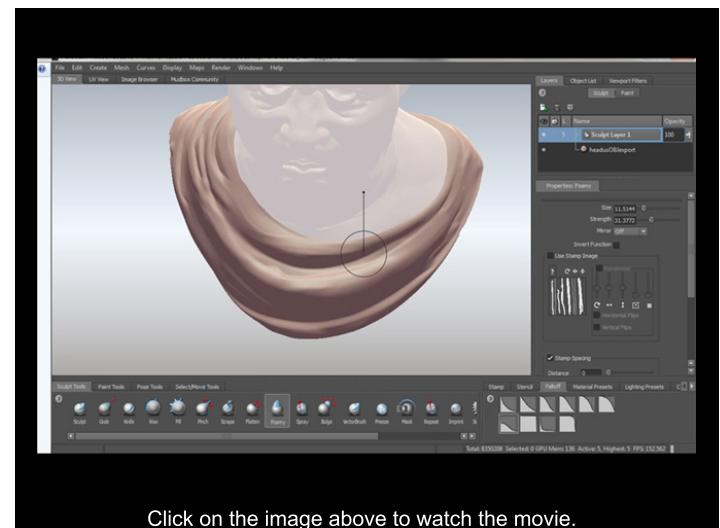
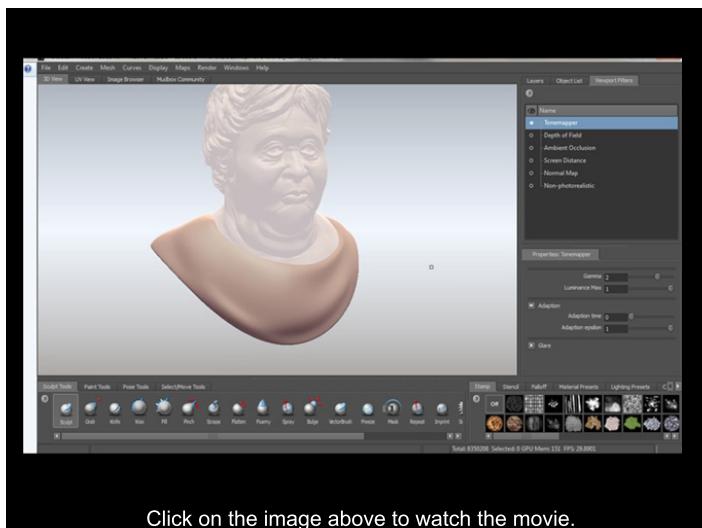
## CLOTH

**(Fig.06)** Cloth is one of those nasty problem areas I mentioned and one that is a continual challenge for most artists. While there are only a small number of fold and crease types, the way they are combined can make some forms rather difficult to sculpt digitally. I used a vector displacement stamp created from a sculpted single polygon. I made a profile of a fold (it was sort of a one size fits all type of thing to give the impression of a fold rather than absolute reality). If this had an undercut it would have been a right royal pain in the backside to sculpt in, so I saved myself a lot of work. No I'm also going to 'fess up' that this one was done 'freestyle' with very little reference. That breaks golden rule number 1, but as my drive containing my reference images had just died on me and the

deadline for this was looming... well you get the picture. **(Fig.07)**

My tip on sculpting cloth is to break it down into very simple shapes. Is there a zigzag lines of folds? Do they travel in similar direction? Is the cloth stiff or very flexible? As chances are that you will never find a 100% perfect reference (unless you are sculpting from an image to match perfectly), you will have to take into account where the body is underneath and how bony parts and gravity will affect the cloth. The geometry I used as a base is a very simple shape I created and I'm guessing its well within the reaches of anyone, no matter how limited their poly modelling skills are. **(Fig.08)** How the cloth will drape is 95% of it as a sculpture. Get that right and the rest will

usually fall into place. Although as with any sculpt you'll find that last 5% is the part that takes the longest.



## RENDER SETUP: VECTOR DISPLACEMENT

While this article is concerned with the model itself and the process involved with it, I wouldn't leave you without information about the render setup. For this model I used mental ray as my render engine inside 3Ds Max along with my 'Vector Displace Shader' that I wrote for use with Mudbox vector displacement maps in mental ray. Its available for free from my company Psycho Core Software at [www.psychocore.com](http://www.psychocore.com) for Maya, 3Ds Max and Softimage from versions 2010 onwards. The web site contains videos showing how to set it up and use it that's outside of the scope of this article, but I can promise you it is very easy to both install and use. (Fig.09)

A map was generated for each part of the sculpt that contained detail (so none were needed for the eyes, just the head and cloth part). You will

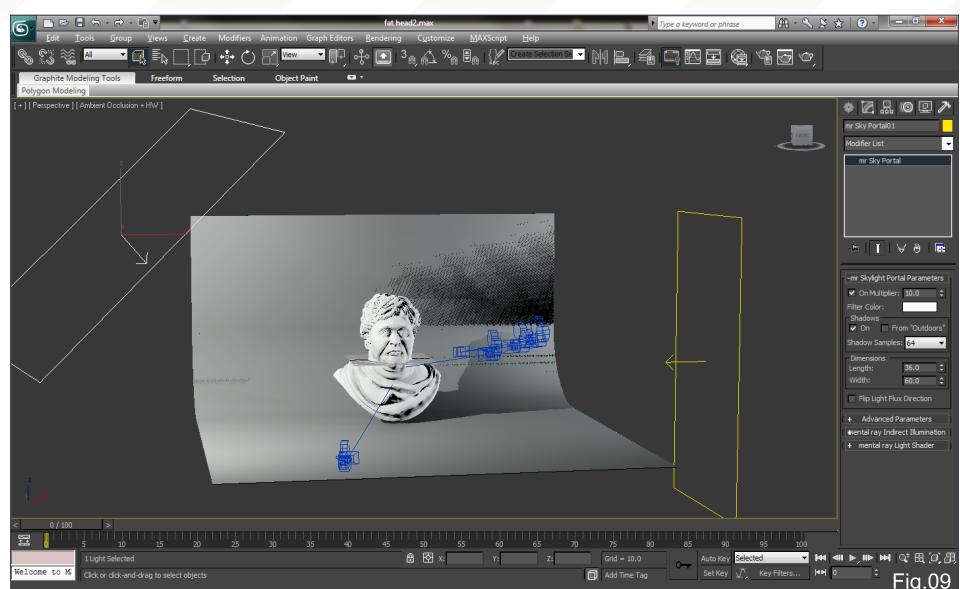


Fig.09

find that vector displacement renders out a lot faster than traditional displacement and handles detail such as overhangs, undercuts & detail types that would cause issues for a standard displacement map that would mean it could not render the model out correctly.

For my lights I used my standard studio setup of 2 huge MR portal lights to screen right and the other at a 45 degree angle from above it. I then turned on final gather and used 2 bounces. I work in a linear color space for my renders. If the word 'linear' isn't one that you've come across before, I urge you to read up on it as it will make a lot of difference to your renders.

## IN CLOSING

Hopefully you've found this article a bit different to last time, and that it's given you some ideas and things to at the very least think about and try. There are no short routes in digital sculpting, there is no magic wand or 'make cool model button'. So until these are invented we must use what we have, our eyes, our hands and our brain to observe and create what we see. You will find times when real life doesn't quite cut it for a model. Sometimes even reality needs a few artistic tweaks to make it more aesthetically pleasing for the viewer. But overall remember that you are supposed to be having fun! Enjoy sculpting and never treat a mistake as a bad thing, because once you've done something wrong and realised it the chances are you'll learn from that mistake and never make it again. So remember ... mistakes are cool because that's the only way we learn.



Fig.10

Next time around our subject is one that is about  
as far from classical sculpture as you can get.

## WAYNE ROBSON

For more from this artist visit

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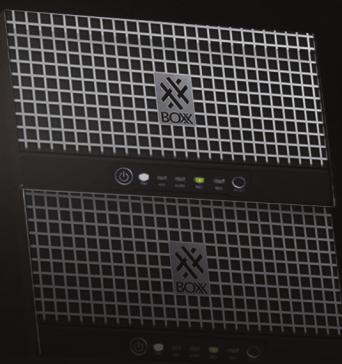
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Knowing your Tools

CHAPTER 3 | THIS ISSUE

Rig Creation – Part 1

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Rig Creation – Part 2

CHAPTER 5 | AUGUST ISSUE 060

Rig Creation - Part 3

CHAPTER 6 | SEPTEMBER ISSUE 061

Facial Rigging and Scripting



The aim of these tutorials is to show and explain how you might tackle rigging your 3D character for animation. These tutorials will give help and advice to novices and experts who are looking to build on their rigging skills or approach rigging for the first time.

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## INTRODUCTION TO RIGGING: 3- RIG CREATION - PART 1

Software Used: 3ds Max

## CHAPTER OVERVIEW

Welcome to the third chapter of the Introduction to Rigging Tutorial Series for Max.

In the previous chapter we spoke about the tools that Max has for rigging. In this chapter we are going to start rigging the character - working on the spine, neck and head.

**Note:** this tutorial has been done with Autodesk 3ds Max 2010, but it can be followed with previous versions of Max (until 3ds Max 7, previous versions would lack the necessary tools).

In case we use specific tools only available in Max2010, we will mention it and we will explain how to make something similar with previous Max versions if needed.

**Note:** during this chapter you will find the word **Maxscene:** followed by the name of the max file. These max scene files are provided by this tutorial, the files are created to illustrate the lessons. Remember to move the time slider, as a lot of them are done with animation to illustrate better the examples.

The files had been created in Autodesk 3ds Max 2010 so can be open only with this version of max or newer ones.

## MAXSCRIPT MACROSCRIPTS

As we saw in the last chapter, we can use maxscript to make things easier, but having to open the script and evaluate it each time we need it is not the best approach.

Max has macroscript, that is the same as a script but that can be used inside max, in the quad, in menus or with a shortcut.

We will use a few macros to rig the character in this chapter.

## INSTALLATION OF THE MACROSCRIPTS

There is a folder named macroscripts for this chapter. Copy the content to the ui/macroscripts

In the root of max, there is a file called **installsettings.ini**, depending of what you have in **useUserProfile** you may have to copy the macro in a different location.

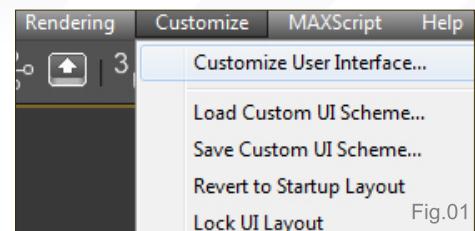
[Least User Privilege]  
useUserProfiles=0

The location is in the root where Max is installed and it is the one I recommend, it is easier to have everything inside the max folder.

C:\Program Files\Autodesk\3ds Max 2010\ui\macroscripts

[Least User Privilege]  
useUserProfiles=1

This is a longer path and is more along the lines of each user having their own scripts or plugins. The only problem is a long path is difficult to



find. The advantage is that you get more than one user using Max, each of them can have their own macroscripts.

C:\Users\luis\AppData\Local\Autodesk\3dsmax\2010 - 64bit\enu\ui\macroscripts (please replace *luis* with your user)

## HOW TO USE THE MACROSCRIPTS

To access a macro you can go through the menu **Customize / Customize User Interface**. (Fig.01)

Then you get different labels depending where you want to use the macroscript - menus, keyboard shortcuts or quads.

All the macros created for this tutorial are inside the category **IMR** (Introduction to Max Rigging)

I recommend adding the macros of **IMR** in the normal quad; to do so just go to the quads label, select the category **IMR** and drag and drop each of the macros in the quad. Now when you right click, the macro for **IMR** will be in the default quad. (Fig.02)

## MACRO COMMENTED INSIDE THE SCRIPT

Some of the macros are simple while others are more complex. If you want to understand how the script works, you will find comments on them. Open each macro with the editor and you will get the explanation of how the script works.

(Fig.03)

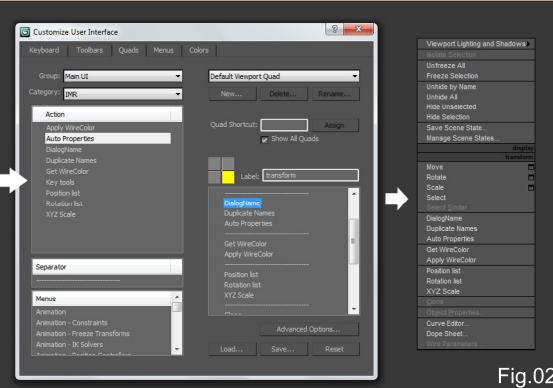
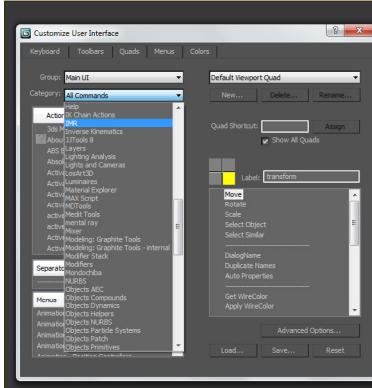


Fig.02

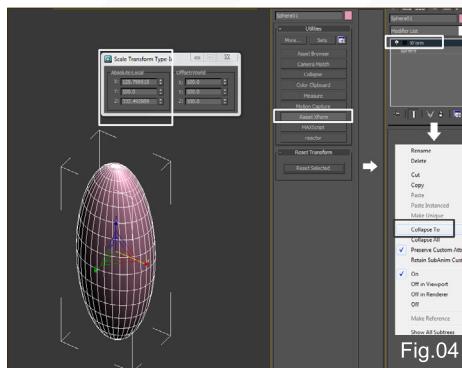


Fig.04

**Note:** We are not going to explain what the macro does in this subchapter. They will be properly explained the first time we mention every macro. After that, we will only say to use a macro in particular we will not explain what it does.

## CHECKING THE MODEL BEFORE STARTING RIGGING

We mentioned in the first chapter the importance of using checklists, this is a list of the things that we have to check before we start rigging.

Maxfile: 3\_Alien\_mesh

### CHECKLIST FOR THE MODEL

- 1 – Each of the geometry has the correct scale. **Reset the xforms**
- 2 – The model is correctly aligned to the world
- 3 – Have you named your model correctly?
- 4 – Are your objects in the correct layer?

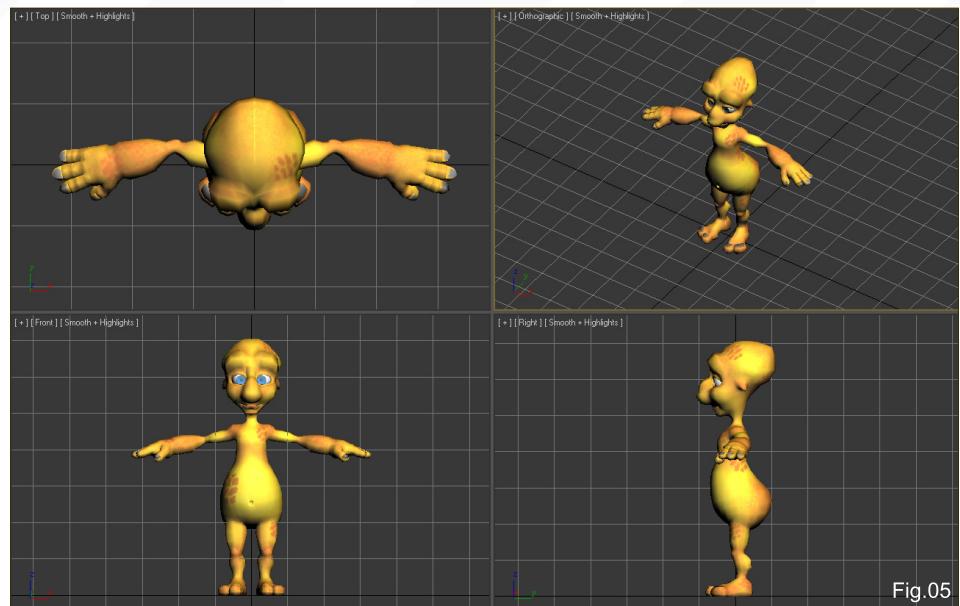


Fig.05

- 5 – Have you checked for duplicate names in your model?
- 6 – Have you placed the model pivot in a logical place?
- 7 – Have you collapsed your stack as much as possible?
- 8 – Have you deleted all of the lights, cams, floorplanes, etc?

### 1 – Each of the geometry has the correct scale. **Reset the xforms**

That means that the scale of each need to be 100,100,100, so the objects have a uniform scale.

In case the scale is not uniform, we can use the utility *reset xform*, and later in the command

panel modify collapse the stack to have a clean mesh.

The reason for this is that using non uniform scales meshes will create problems with the modifier skin, mainly when we want to paste the symmetry of skin. (Fig.04)

### 2 – The model is correctly aligned to the world

(Fig.05) By this we mean checking if the model is centred on the world and the front, top and side views match the top, front and sides of the character. It is quite common to have the character not centred or rotated. Having the character properly aligned will make our lives much easier when we rig.

### 3 – Have you named your model correctly?

(Fig.06) Make sure all the objects are properly named with the naming convention we explained in the first chapter.

### 4 – Are your objects in the correct layer?

Using the naming convention described in the first chapter we will be sure the layer \_mesh exists and the objects are inside.

In the Maxfile: 3\_Alien\_mesh there is not layer Alien\_Mesh, so we will create one and put all the objects inside.

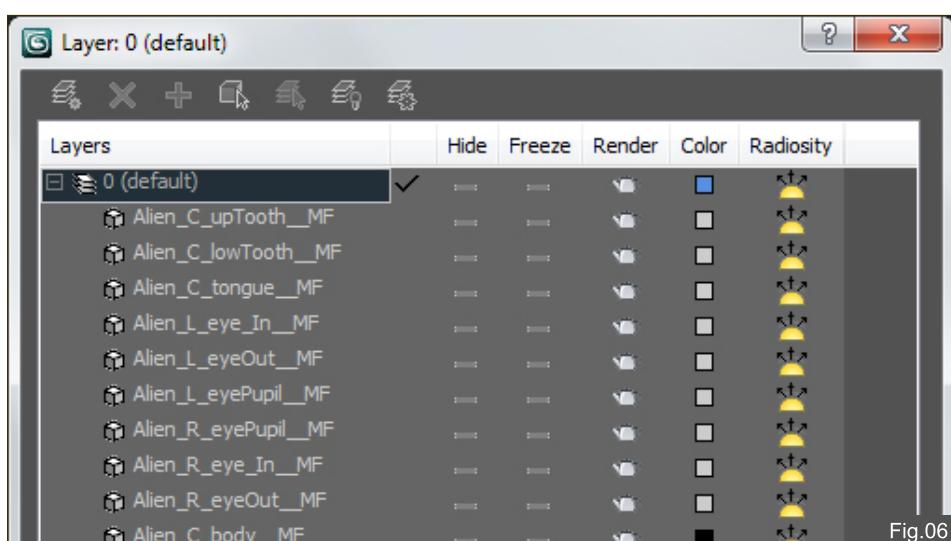


Fig.06

5 - Have you checked for duplicate names in your model?

Be sure all the names are unique - having duplicate name can create problems. Checking for duplicates names by hand is quite tedious so I had created a macro that will tell you if you have duplicate objects in the scene and allow you to select them.

The IMR macroscript is named **Duplicates Names** (Fig.07)

6 - Have you placed the model pivot in a logical place?

Having the pivot point of each object in the logical place is important. Normally the main mesh for the body will have its pivot point in the 0,0,0 of the world and the pivot aligned to the world.

7 - Have you collapsed your stack as much as possible?

Usually in the process of modeling we get a complicate modifier stack. Remember to collapse them as much as possible when we start rigging.

8 - Have you deleted all of the lights, cams, floor planes, etc? (Only your clean model should exist in the file)

Normally we have cameras and light in the scene for creating a render, and probably a plane for the floor. When we start rigging we want to have a scene will only the geometry objects.

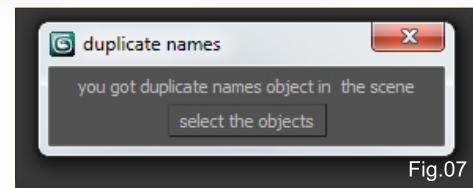


Fig.07

## MASTER OF THE RIG

(Fig.08 + Fig.09) We should always start the creation of the rig with the master. Master is the object that will be the parent of the object of the rig. Normally when we create the master, we create the layers we are going to need in the process, so we can add the desired objects to the desired layers.

Steps:

- 1) Create all the layers we are going to use in the rig: Alien\_Mesh, Alien\_Controls , Alien\_Proxy , Alien\_Hidden
- 2) Create a spline circle and be sure is in the world coordinates 0,0,0 and rotation is 0,0,0 . It is a good practice to create the spline circle in the top view.
- 3) Create a triangle with line spline
- 4) Convert the circle to an editable spline
- 5) Attach the triangle to the curve
- 6) Set a yellow color to the wire color
- 7) Name the object Alien\_C\_Master\_SA
- 8) Add Alien\_C\_Master\_SA to the layer Alien\_Controls
- 9) Select all the meshes in the Alien\_mesh and lock them in position, rotation and scale in the

Command Panel – Hierarchy/ Link Info so we

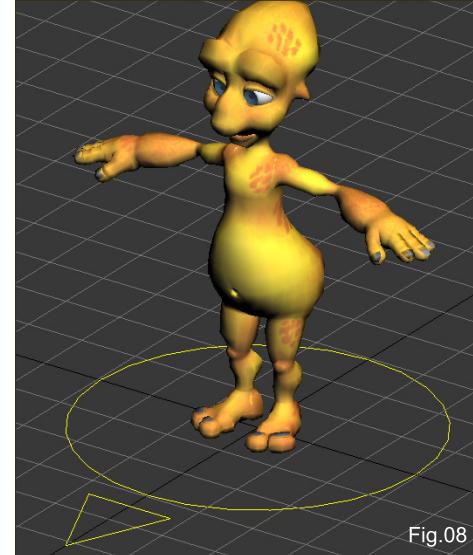


Fig.08

don't transform the objects by mistake when we are creating the rig.

**Note:** the small triangle on the front of the circle is to point where the character is looking.

## SPINE RIG

### 5.1 BONES

(Fig.10) We will create one bone for the rig cage. Even if the rig cage has lots of bones in reality, they move all together, so we will use a single bone.

For the spine we will use 5 bones. In reality, the spine has 38 or 39 elements but we simplify it in rigging. The hips consist of one bone. Again, that body area has more bones but simplification is better. We place the bones closer to the back of the body, where the spine is in reality.

### 5.2 CONTROLS

#### Pelvis

This is the main controller for a spine and if we move it the rest of the spine will follow. It is the first control that animators start to animate. When you move and rotate it, the spine, arms, neck and head follow. (Fig.11 + Fig.12)

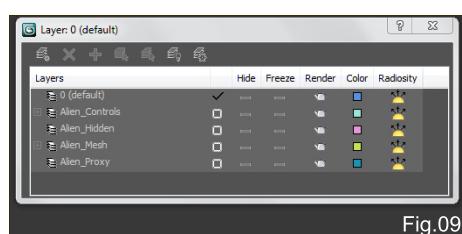


Fig.09

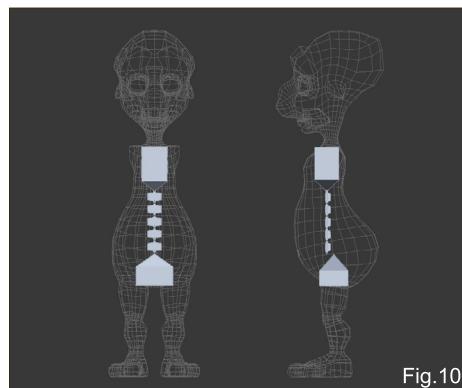


Fig.10

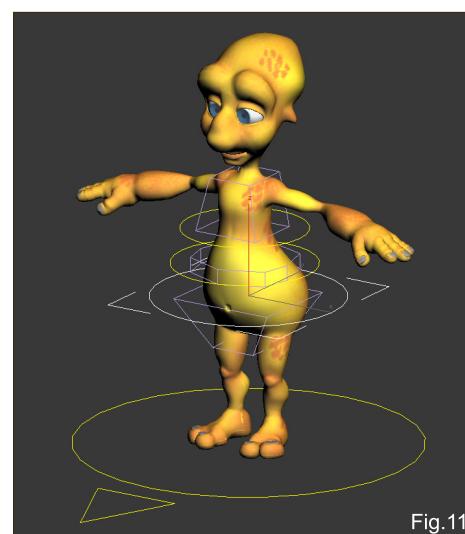


Fig.11

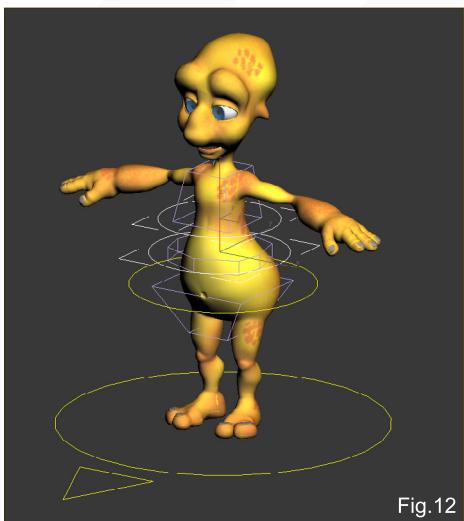


Fig.12

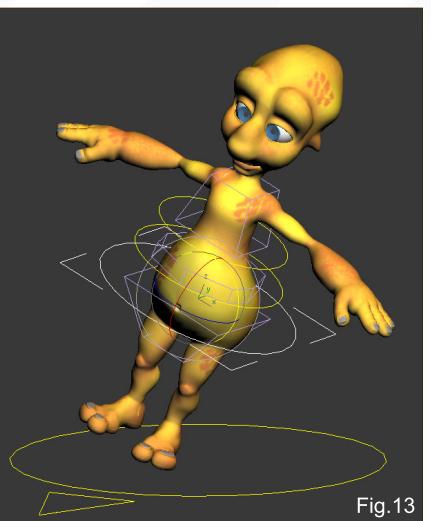
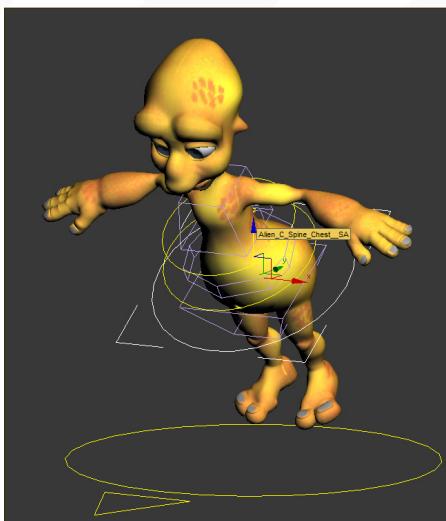


Fig.13

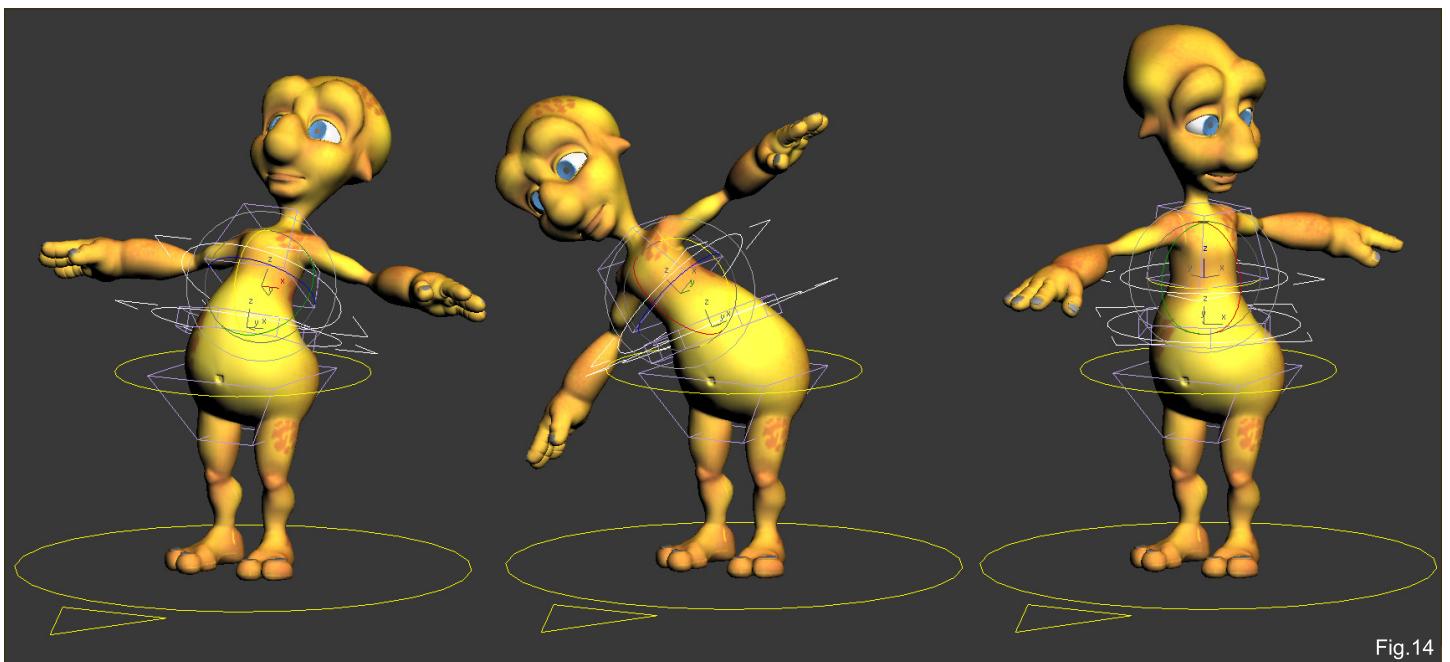


Fig.14

#### Spines

We have two spine controls and by rotating them we can achieve a lot of the desired poses for the upper body. (Fig.13 + Fig.14)

#### Independent Hips

A lot of the time we want to rotate or move the hips without affecting the rest of the spine or upper body. That is why we have independent hips. (Fig.15 + Fig.16)



Fig.15

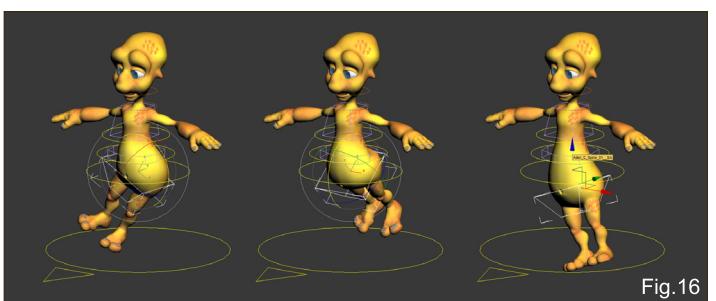


Fig.16

#### Independent Chest

We have a similar case with the chest. Sometimes we like to move or rotate only the chest without affecting the other parts of the spine. (Fig.17 + Fig.18)

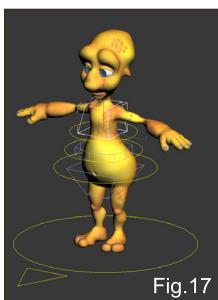


Fig.17

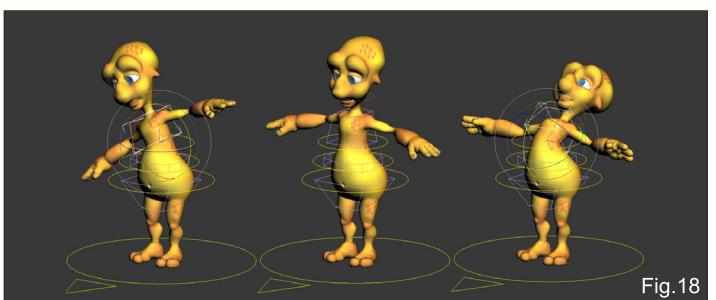


Fig.18

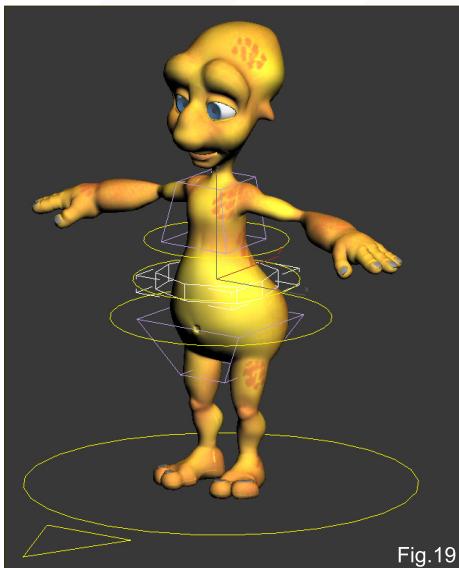


Fig.19

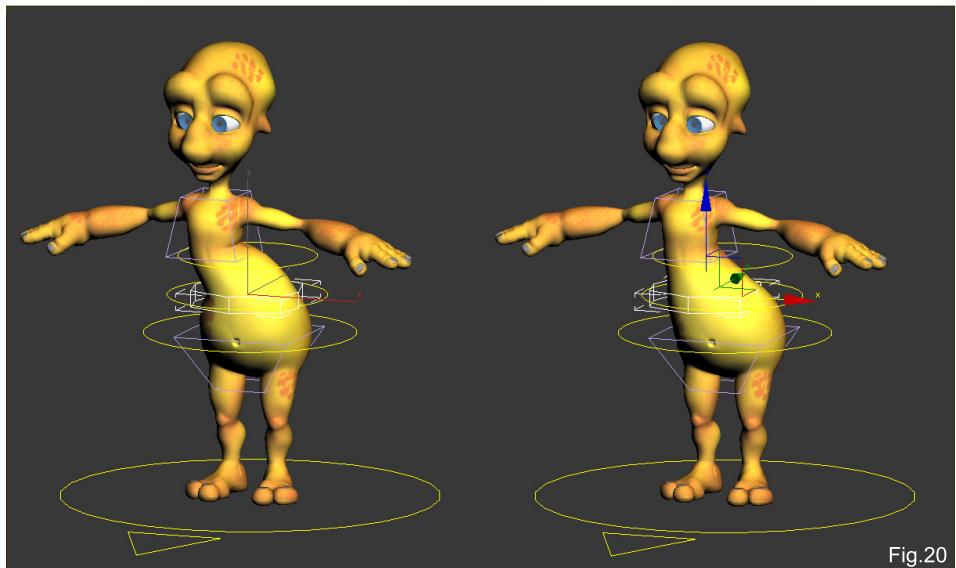


Fig.20

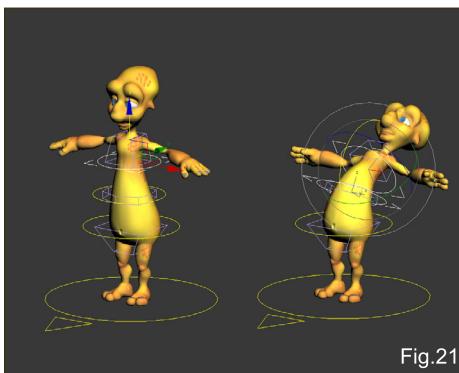


Fig.21

#### Spine Middle

It is a control to manipulate the middle of the spine. This is normally useful with the movement of the hips or chest. It is used to compensate and tweak the pose. (Fig.19 + Fig.20)

#### Stretch Spines

We can move the spine up and down and this will stretch the spine. This can be combined with rotation. (Fig.21)

### 5.3 CREATION OF THE SPINE RIG

**Note:** we can hide part of a mesh in Max. You can do it in the *editpoly* in face mode *hideselected*.

I recommend hiding the arms so it is easier to place controls and bones for the spine. (Fig.22a)

**Note:** we will start all the objects names for the spine with "Alien\_C\_Spine" This allows us to do

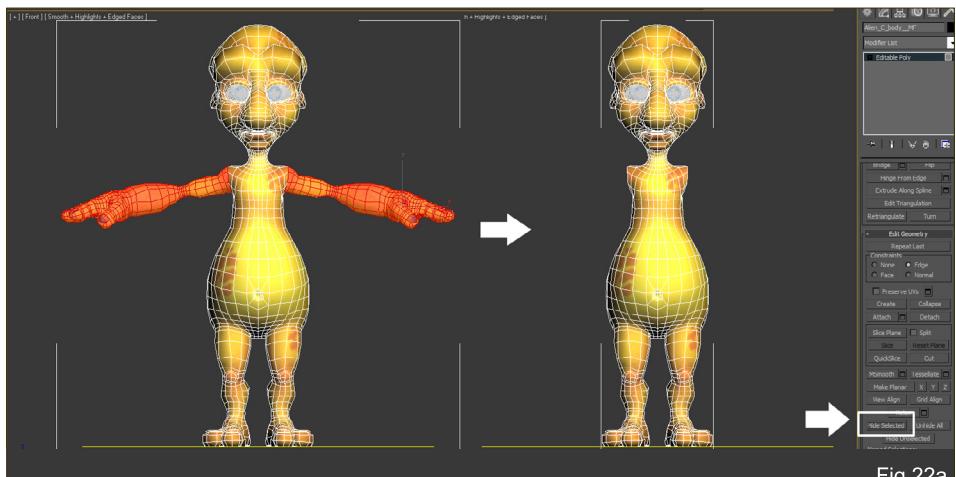


Fig.22a

a selection of **Alien\_C\_Spine\***, to quickly select the spine system.

**Note:** during this chapter you are going to be asked to align an object to another a lot of times. Align can have different options, but we always want to align the objects in position and rotation and from pivot point to pivot point. Check the image for the options to align. (Fig.22b)

1- We will now start creating the pelvis, so we will create a spline circle and place it in the proper place. Remember that it needs to be centred to the world and orientated as the master.

The spline will be named **Alien\_C\_Spine\_pelvis\_SA**

2- Link **Alien\_C\_Spine\_pelvis\_SA** to **Alien\_C\_Master\_SA**

3- Apply the IMR macro position list to the

spline. What this script does is to create a float list, create a second channel and make that channel active. It will make it work with the

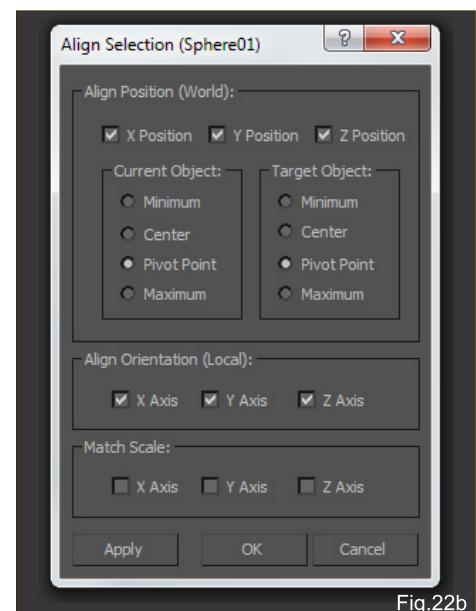


Fig.22b

zero out rule described in chapter 2/ 5.2 the zero out rule. (Fig.23)

- 4- Create another circle and align it to the pelvis
- 5- Rename the circle to **Alien\_C\_Spine\_01\_SA** and link it to **Alien\_C\_Spine\_pelvis\_SA**
- 6- Duplicate the spine\_01 and move it up near where the rig cage is.
- 7- The duplicate will be named **Alien\_C\_Spine\_02\_SA**
- 8- Try to make the distance between **Alien\_C\_Master\_SA** with **Alien\_C\_Spine\_01\_SA** and **Alien\_C\_Spine\_01\_SA** with **Alien\_C\_Spine\_02\_SA** equal. (Fig.24)

- 9- Create a box and align it to **Alien\_C\_Spine\_02\_SA**
- 10- Convert the box to an edit poly, and modify the box until it covers the chest area.
- 11- In edit poly, edge mode select all the edges.
- 12- Use the create shape for selection button and in the option select linear.

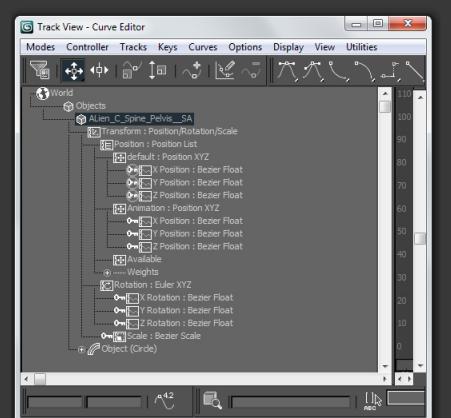
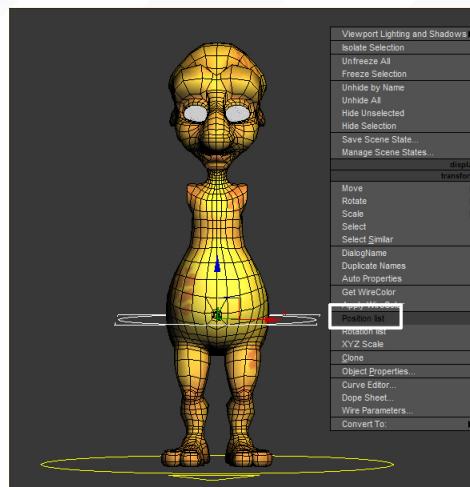
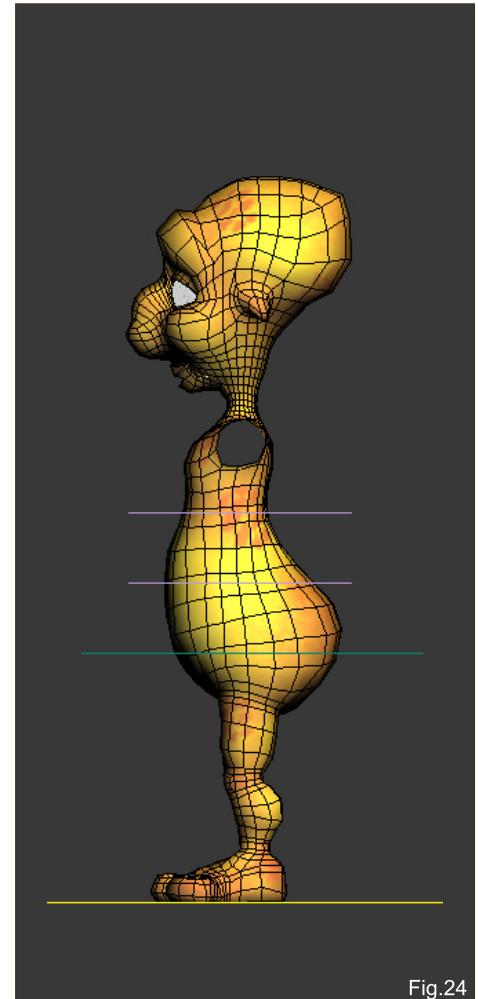
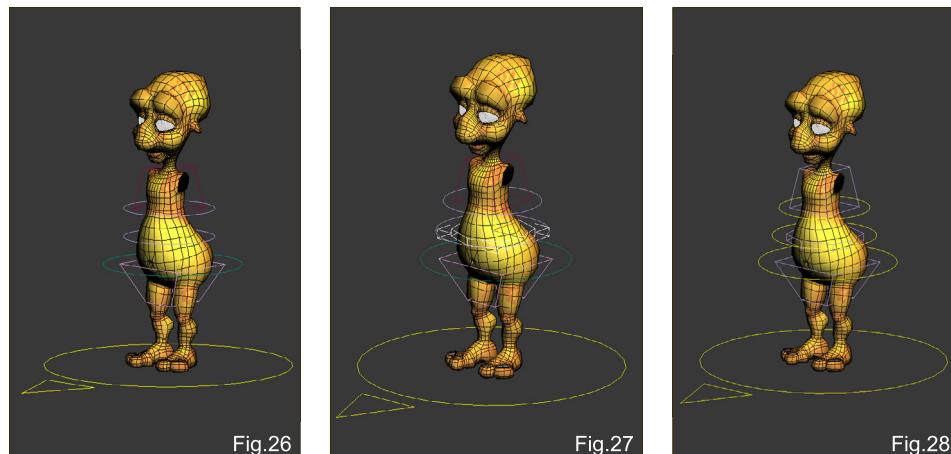
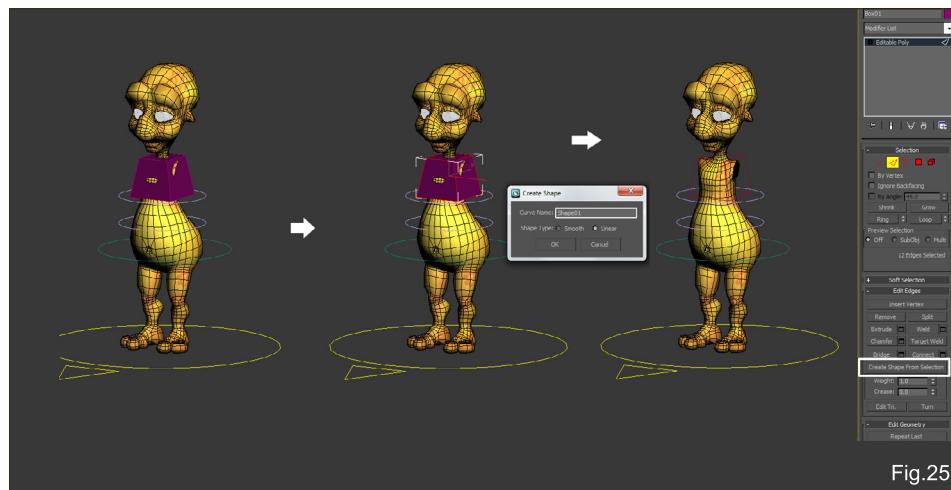


Fig.23

- 13- Delete the box, and rename the spline to **Alien\_C\_Spine\_Chest\_SA**
- 14- Link **Alien\_C\_Spine\_Chest\_SA** to **Alien\_C\_Spine\_02\_SA** (Fig.25)

- 15- Now do the same process with the **Alien\_C\_Master\_SA** and rename the final spline to **Alien\_C\_Spine\_hips\_SA** and link to **Alien\_C\_Master\_SA** (Fig.26)



- 16- Repeat the process with **Alien\_C\_Spine\_02\_SA** and create **Alien\_C\_Spine\_middle\_SA** (Fig.27)

- 17- We have created all the animation controllers we need for the spine. Now we will put the correct wire colors to make things easier to visualize. (Fig.28)

**Note:** to copy and paste wire color quickly, use the IMR macro Get Wirecolor, Apply wirecolor. The first macro will copy the wire color of the selected object and the second one will paste the copied color to the selected objects.

Open Maxfile: 5\_alien\_spine\_02.max to be in this stage

18- Now that we have got the control created, we want to change where the spine rotates so we want the Alien\_C\_Spine\_01\_SA and Alien\_C\_Spine\_02\_SA not to rotate from their own centre, we want them to rotate from the base of the parent.

To do this we create a point aligned to Alien\_C\_Spine\_pelvis\_SA and linked to it. We name the point Alien\_C\_Spine\_01\_rot\_DH .

Then we create another point align to the Alien\_C\_Spine\_01\_SA. This point will be named Alien\_C\_Spine\_01\_base\_DH.

Alien\_C\_Spine\_01\_SA is linked to Alien\_C\_Spine\_01\_base\_DH and Alien\_C\_Spine\_01\_base\_DH is linked to Alien\_C\_Spine\_01\_rot\_DH

19- Create a float list in rotation of the Alien\_C\_Spine\_01\_SA

20- Wireparameter the three rotation axes of

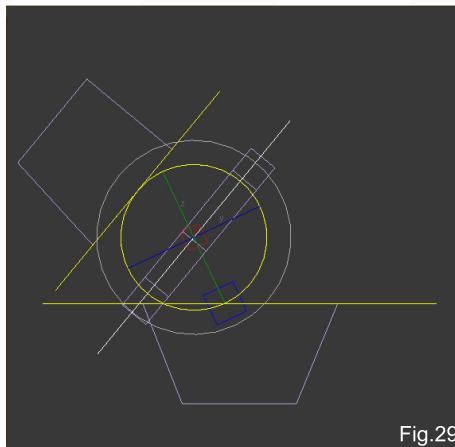


Fig.29

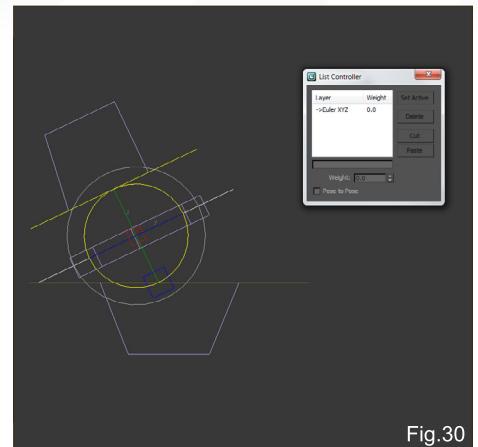


Fig.30

Alien\_C\_Spine\_01\_SA to the three axes of rotation of Alien\_C\_Spine\_01\_rot\_DH.

21- Now when we rotate the Alien\_C\_Spine\_01\_SA, it will rotate the Alien\_C\_Spine\_01\_rot\_DH (Fig.29)

22- It will rotate from the base as we wanted, because the wiring rotates Alien\_C\_Spine\_01\_rot\_DH but Alien\_C\_Spine\_01\_SA is rotating too, so we get double rotation, although we only want to rotate from the base.

To avoid the double rotation we will open the weight of the float list and make it in 0.

By doing this, the rotation of Alien\_C\_Spine\_01\_SA will not work because of its weight 0, but Alien\_C\_Spine\_01\_rot\_DH will still work because of the wiring. (Fig.30)

23- Follow the same process with Alien\_C\_Spine\_02\_SA creating Alien\_C\_Spine\_02\_rot\_DH and Alien\_C\_Spine\_02\_base\_DH.

Open Maxfile: 5\_alien\_spine\_03.max to be in this stage

24- To do the stretch of the spine, apply an IMR position list to Alien\_C\_Spine\_01\_base\_DH. Wire the position Z of Alien\_C\_Spine\_02\_SA to the animation/position Z of Alien\_C\_Spine\_01\_base\_DH

This will allow the spine to stretch when we

move Alien\_C\_Spine\_02\_SA in Z position. Open Maxfile: 5\_alien\_spine\_04.max to be in this stage

25- Create two bones and align and link them to Alien\_C\_Spine\_Chest\_SA and Alien\_C\_Spine\_Hips\_SA

Name them Alien\_C\_Spine\_Chest\_SK\_BH and Alien\_C\_Spine\_Hips\_SK\_BH  
26-Rotate the bones until they go in the right direction. To modify the bone length, the easiest way is to use the bone tools. (Fig.31)

The only thing left is the five bones of the vertebral spine. These five bones will be moving inside a spline, and the spline will be following Alien\_C\_Spine\_Chest\_SA , Alien\_C\_Spine\_Hips\_SA and Alien\_C\_Spine\_middle\_SA.

This is the most complicated part of the spine rig and will take a few steps.

27- To make things visually more clear, hide everything apart from Alien\_C\_Spine\_Chest\_SA , Alien\_C\_Spine\_Hips\_SA and Alien\_C\_Spine\_middle\_SA and Alien\_C\_Spine\_01\_rot\_DH.

28- We will create a spline line, we can use snap with the pivot option to be sure the points are at the centre of the objects. Once created, be sure all the points are Bezier so we get handles to manipulate it.

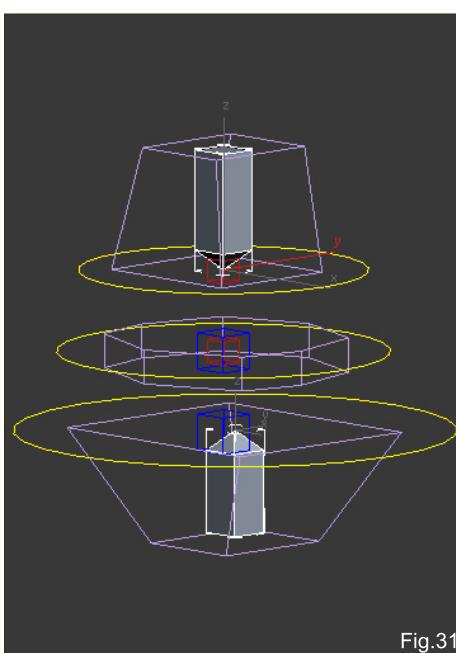


Fig.31

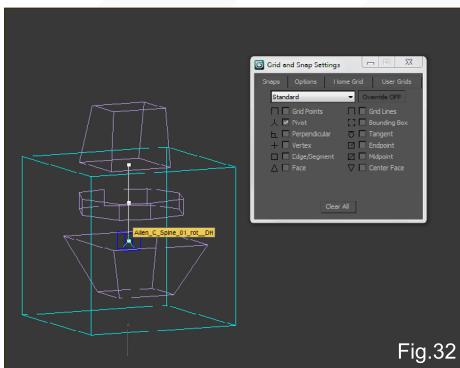


Fig.32

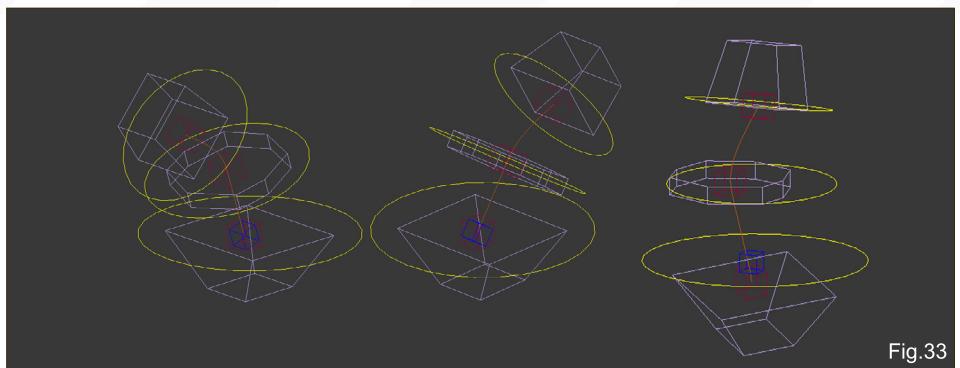


Fig.33

We name the spline to **Alien\_C\_spine\_spline\_SH** (Fig.32)

29- To make the spline follow the control we will skin the spline, but because the controls objects are splines, and splines objects don't work in skin, we will create points for driving the skin. The points will be named: **Alien\_C\_Spine\_Hips\_SK\_DH**, **Alien\_C\_Spine\_Hips\_SK\_DH**, **Alien\_C\_Spine\_Hips\_SK\_DH**, and they will be linked to the controllers.

30- We will skin the spline again with the three points created and use skin, vertices, and weight tool to be sure it moves properly with the controllers.

31- Unhide **Alien\_C\_Spine\_Pelvis\_SA**, **Alien\_C\_Spine\_Pelvis\_SA** and **Alien\_C\_Spine\_02\_SA** and test it by moving the controllers that the deformation of the spline

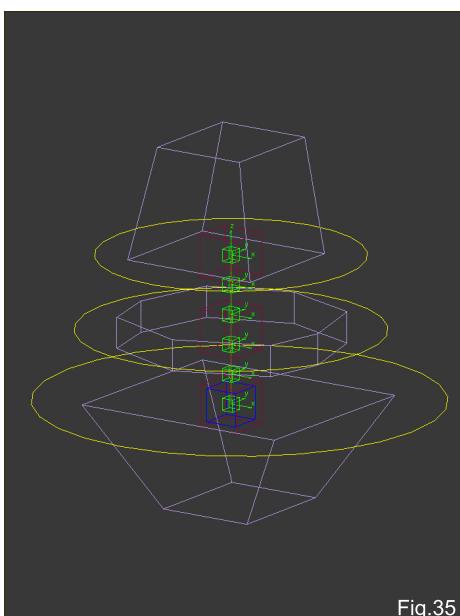


Fig.35

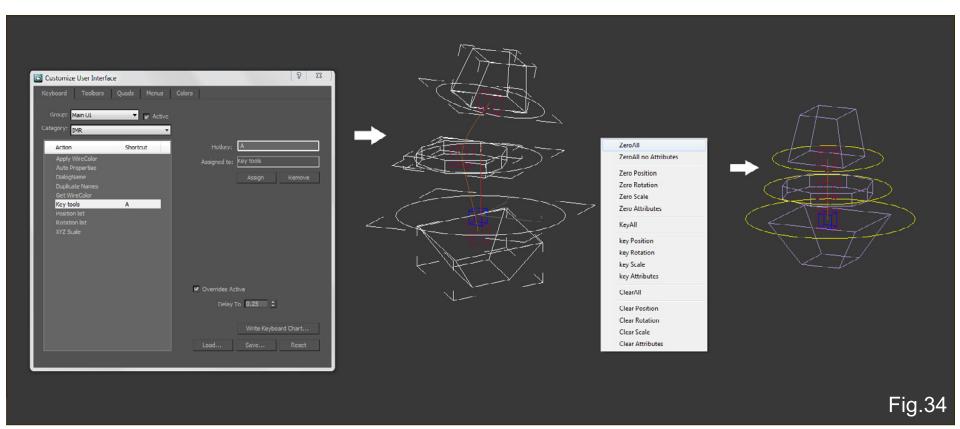


Fig.34

follows properly. The controllers have setup the skin correctly. (Fig.33)

32- Once we have moved and rotated all the controllers, it is difficult to go back to the original position; we can go to the track view and be sure each value is setup to 0.

Instead we can use a macro in **IMR**. The macro is named **Key Tools**. Instead of putting in the quad, we will use it in a shortcut, for instance the key **A**.

So we will press the key **A** and a menu will appear and we will choose **ZeroAll**. This will put all the values for the controllers of the selected object in 0.

I use **key tools** all the time when I am rigging and animators use it to reset the rig, set keys, or delete animation. (Fig.34)

Open **Maxfile: 5\_alien\_spine\_05.max** to be in this stage

33- Now we have to create 5 bones and make them follow the spline.

So to do so, first we create 6 points, and apply a path constrain. Remember to erase the keys in the path controller, or the point objects will be animated and move when we move the timeline. Remember to make the point children of the main master **Alien\_C\_master\_SA**.

The object will be in the 0, 20, 40, 60, 80, 100 percent of the spline, and named **Alien\_C\_spine\_spline\_01\_DH**, **Alien\_C\_spine\_spline\_02\_DH**, **Alien\_C\_spine\_spline\_03\_DH** ...

34- We will create 6 bones. The last one will be just the end of the chain.

**Alien\_C\_spine\_spline\_01\_Sk\_BH**, **Alien\_C\_spine\_spline\_02\_Sk\_BH**, **Alien\_C\_spine\_spline\_03\_Sk\_BH**, **Alien\_C\_spine\_spline\_04\_Sk\_BH**, **Alien\_C\_spine\_spline\_05\_Sk\_BH**, **Alien\_C\_spine\_spline\_end\_BH**, (Fig.35)

35- **Alien\_C\_spine\_spline\_01\_Sk\_BH** will be linked to the main master **Alien\_C\_master\_SA** and position constrain to **Alien\_C\_spine\_spline\_01\_DH**.

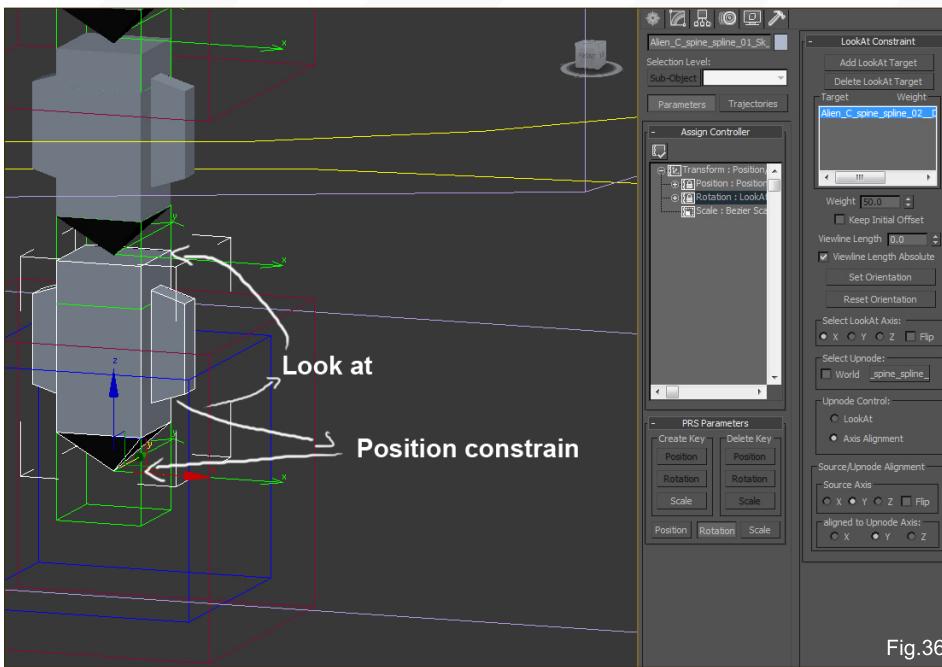


Fig.36

It will have a look at constrain to the next point in the spline **Alien\_C\_spine\_spline\_02\_DH**, with view line length in 0, the upnode will be **Alien\_C\_spine\_spline\_01\_DH** and axis alignment in **Y** and **Y**. (Fig.36)

36- Do the same for the next 5 bones.

37- The final thing is to orientate constrain the point in the path to the sk objects of the spline to manage the twists, so if we rotate the spine in **Z** axis the bones would twist. (Fig.37 + Fig.38)  
Open **Maxfile: 5\_alien\_spine\_05.max** to be in this stage

38- The animation rig is almost finished but we need a proxy mesh to read the volume when we move the rig

39- Clone the mesh **Alien\_C\_body\_MF** and name it **Alien\_C\_body\_PF**

40- You can cut and select faces to create the proxy meshes for the animation rig. We will use

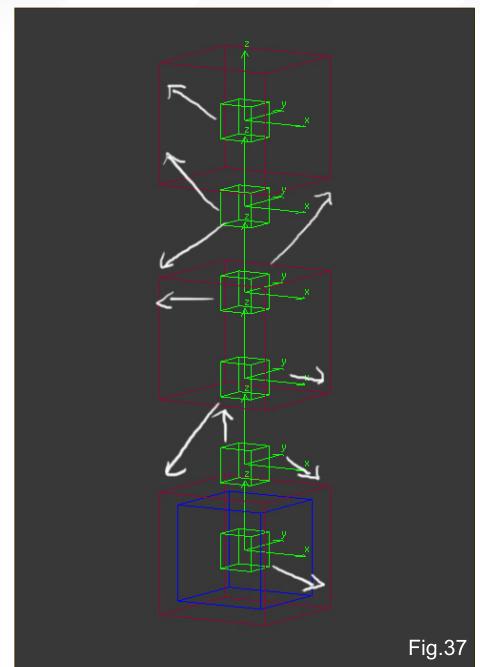


Fig.37

the **detach** in **editpoly** to create a separated mesh. (Fig.39)

41- You can use the tool **slice plane** for making clean perpendicular cuts to the bones, but be sure you got the faces you want to cut selected - if you don't select any face, it will cut all the faces the slice plane touches. (Fig.40)

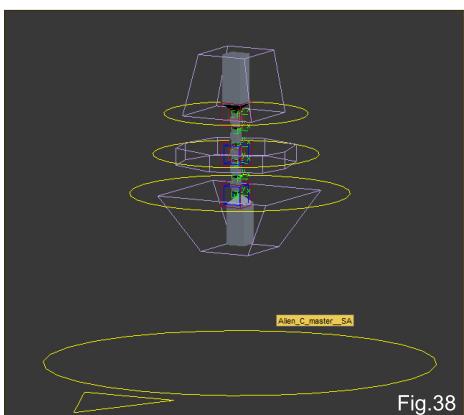


Fig.38

43- The detached names will be linked to the bones and named: **Alien\_C\_Spine\_Hips\_PF**, **Alien\_C\_spine\_spline\_01\_PF**, **Alien\_C\_spine\_spline\_02\_PF**, **Alien\_C\_spine\_spline\_03\_PF**, **Alien\_C\_spine\_spline\_04\_PF**, **Alien\_C\_spine\_spline\_05\_PF** and **Alien\_C\_Spine\_Chest\_PF**

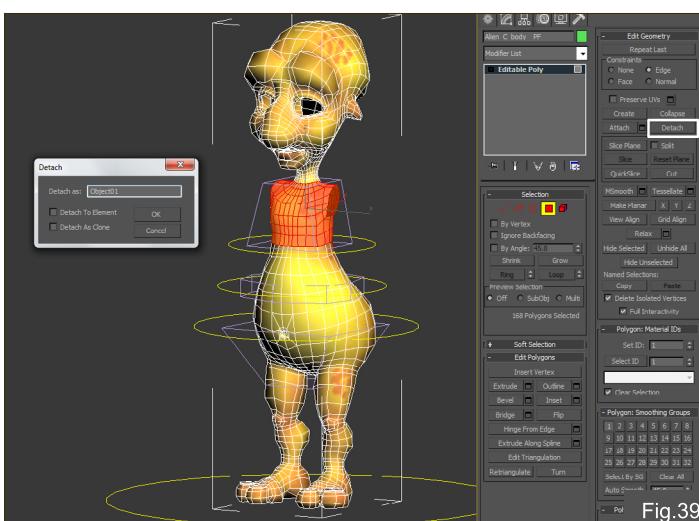


Fig.39

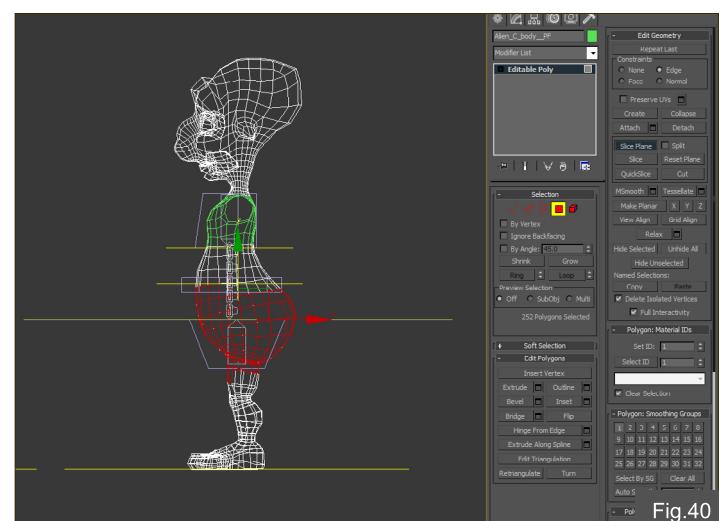


Fig.40

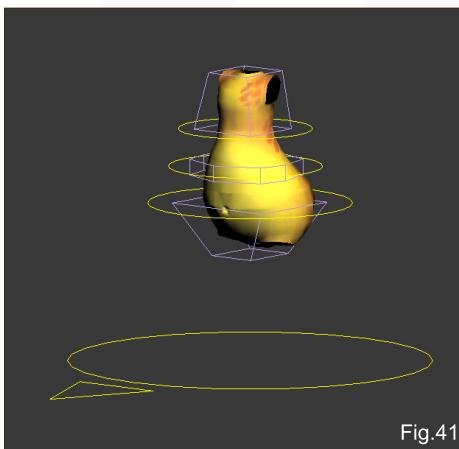


Fig.41

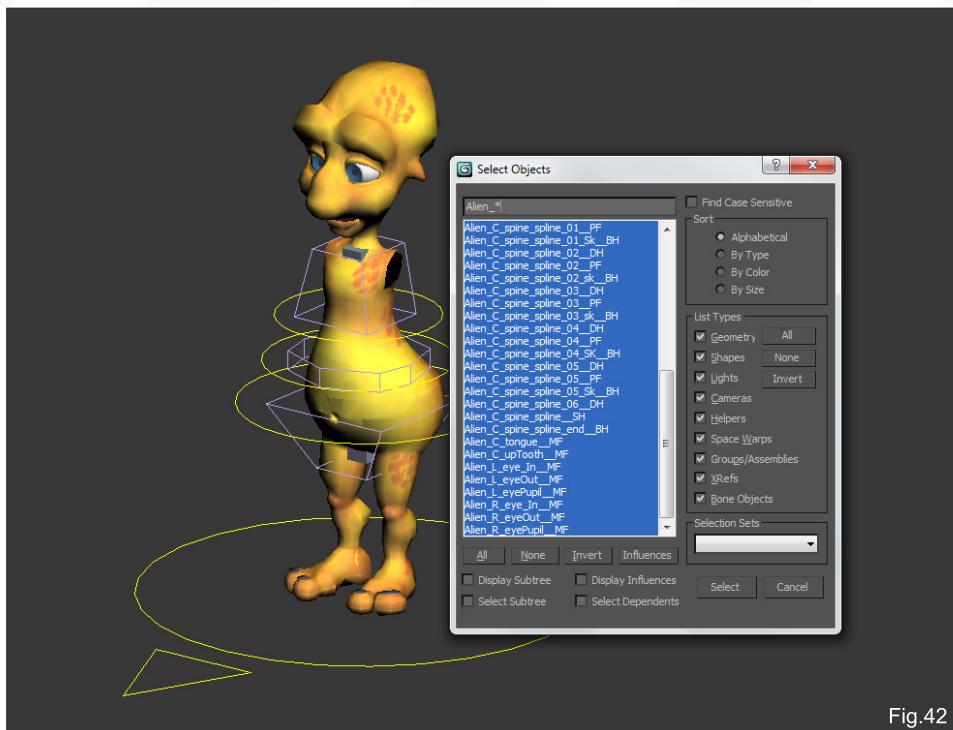


Fig.42

44- Now the spine is ready to start animation  
(Fig.41)

Open Maxfile: 5\_alien\_spine\_06.max to be in this stage

#### 5.4 CHECKLIST FOR RIGGING SPINE

Before we move on to another part of the rig it is good to do a checklist for rigging. There are always too many things to remember to check. Using this checklist will make things easier.

- 1- Proper names
- 2- Proper names for the layers
- 3- Objects in their correct layers
- 4- No object in layer 0
- 5- No duplicates names
- 6- Move the master and check all the meshes

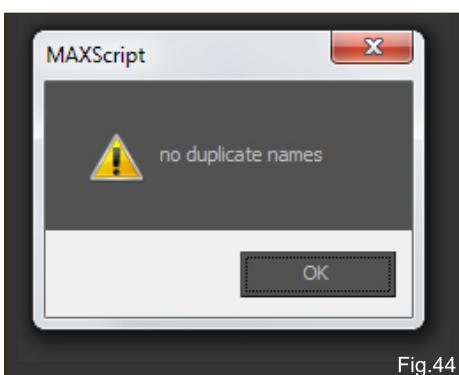


Fig.44

follow correctly

- 7- Controls have correct rotation orders
- 8- Limited keyability in controls and proper locks
- 9- Rotate and move the rig with autokey to check all is ok
- 10- Delete keys and leave a clean version for animators
- 11- Be sure IMR key tools zero all works properly

Because this is the first time we see the checklist we are going to review point by point.

##### 1- Proper names

We have been careful and named everything, but it is always good to open the selection tool with H on the keyboard, and use "Alien\_\*" to be sure everything is selected and we don't have any object without names.

(Fig.42)

##### 2- Proper names for the layers

We did that at the beginning when we created the master. Double check that.

(Fig.43)

##### 3- Objects in their correct layers

Some objects are in the layer 0, so we need to

put these objects in the correct layer.

We can do this by hand, but it can be quite tedious, there is a much easier way.

Use the selection tool typing "\* \_\_H" This selects all the hidden objects, so you can put them in the hidden layer (Alien\_Hidden)

"\* \_\_SA" selects all the control objects. Put them in the control layer (Alien\_controls)

"\* \_\_PF" selects all the proxy objects. Put them in the control layer (Alien\_controls)

This demonstrates the power of naming convention.

##### 4- No objects in layer 0

After putting everything in the right layers, be sure there is nothing in the layer 0.

##### 5- No duplicate names

Make sure all the names are unique - having duplicate name can create problems.

The IMR macroscript **Duplicates Names** will help with this.

As we have named things carefully, we don't have duplicate names in our scene.

(Fig.44)

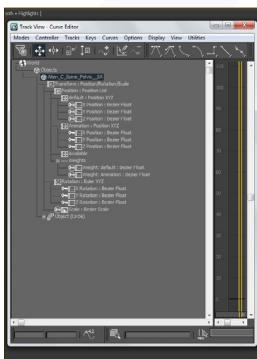


Fig.45

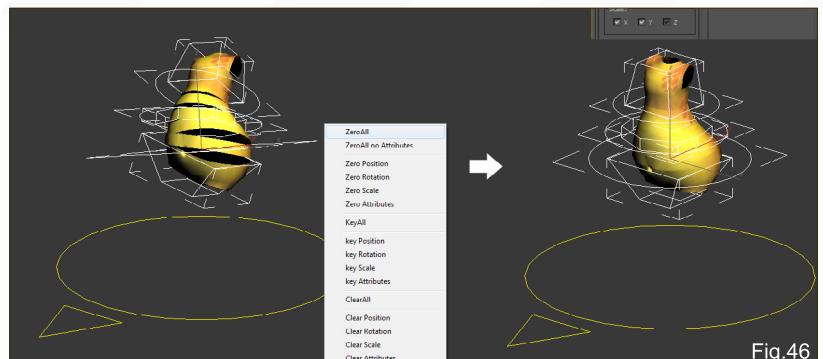


Fig.46

6- Move the master and check all the meshes follow properly.

This is self explanatory.

## 7- Controls have correct rotation orders

For all the controls, XYZ is the correct axis order.

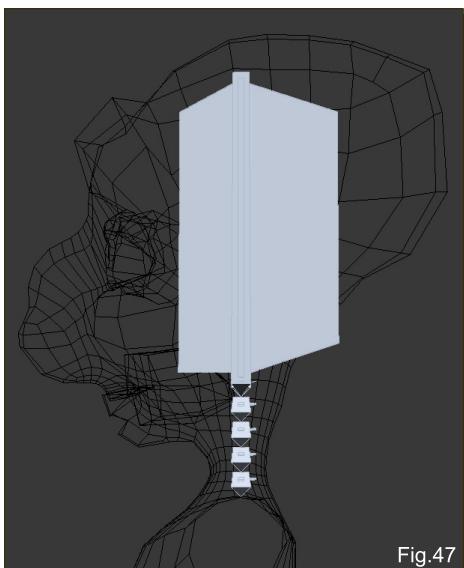


Fig.47

8- Limited key ability in controls and proper locks

This means that we need to check what controllers are available to be animated in the control objects and be sure the locks are setup properly

Alien\_C\_Spine\_Pelvis\_SA has key able position and rotation and the scale is locked. (Fig.45)

Alien\_C\_Spine\_01\_SA key able the rotation and lock in move and scale

Alien\_C\_Spine\_02\_SA key able rotate and move Z and locks scale and move X and move Y

Alien\_C\_Spine\_Middle\_SA key able move and rotate and lock in scale

Alien\_C\_Spine\_Chest\_SA key able move and rotate and lock in scale

Alien\_C\_Spine\_Hips\_SA key able move and rotate and lock in scale

9- Rotate and move the rig with auto key to check all is ok

This is self explanatory.

10- Delete keys and leave a clean version for animators

Once we finish with the test, we select the control and remove the keys. You can use IMR key tool for this.

11- Be sure IMR key tools zero all works properly (Fig.46)

Open Maxfile: 5\_alien\_spine\_06.max to be in this stage

## 6) HEAD AND NECK RIG

### 6.1) BONES

(Fig.47) We need one bone for the skull. There is another important one, that is the jaw bone, but we will create the jaw bone when we speak about facial rig.

For the neck we use 4 bones to simplify the vertebrae of the neck.

### 6.2) CONTROLS

We have two controls for the head and neck.

#### Neck

(Fig.48) The neck control can be rotated in any direction and makes the bones of the neck rotate. The 4 bones of the neck react to the rotation of the neck base making a nice curve.

(Fig.49)

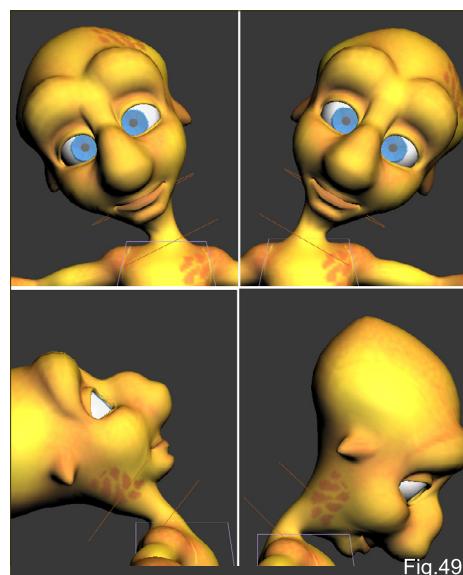
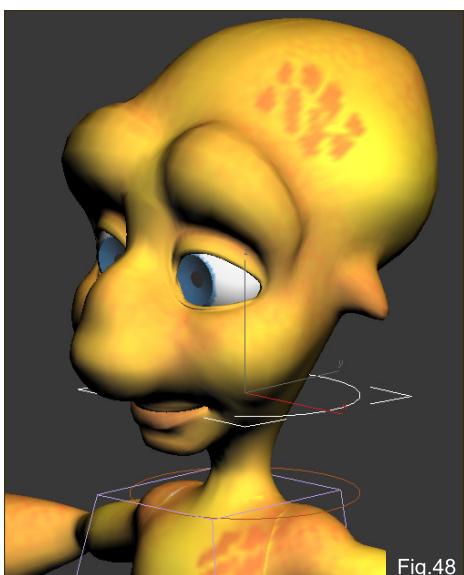


Fig.48

Fig.49



Fig.50

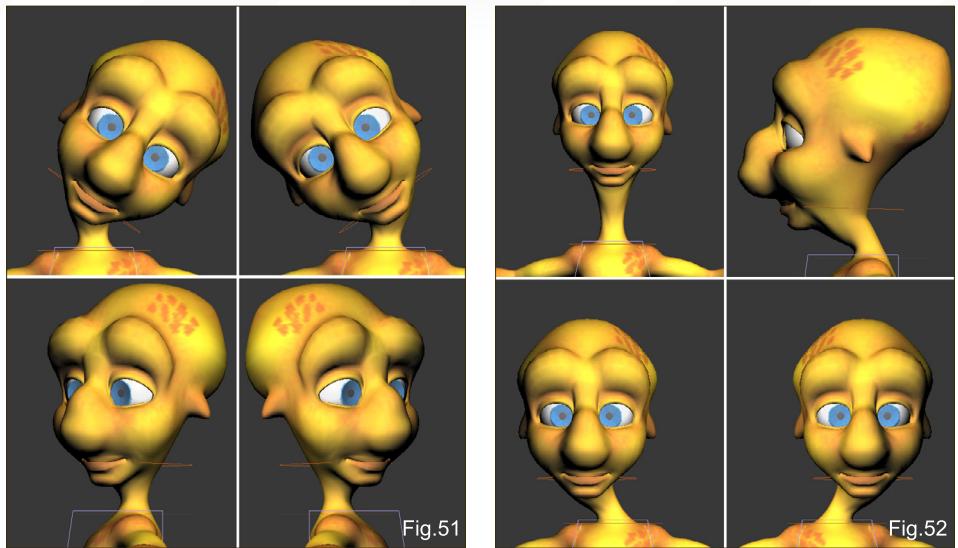


Fig.51

Fig.52

### Head

**(Fig.50)** The head control can rotate and move. It is important that we can rotate the head separated from the neck. **(Fig.51)**

When we move the head control sideways and back and forward, we can achieve nice poses that we can't achieve with rotation. By moving the head control up and down we stretch the neck. **(Fig.52)**

### 6.3) CREATION OF THE HEAD AND NECK RIG

1- Create a point and align and link it to Alien\_C\_Spine\_Chest\_SA. Name it Alien\_C\_neck\_root\_DH.

2- Place Alien\_C\_neck\_root\_DH in the beginning of where you think the base of the neck is going to be.

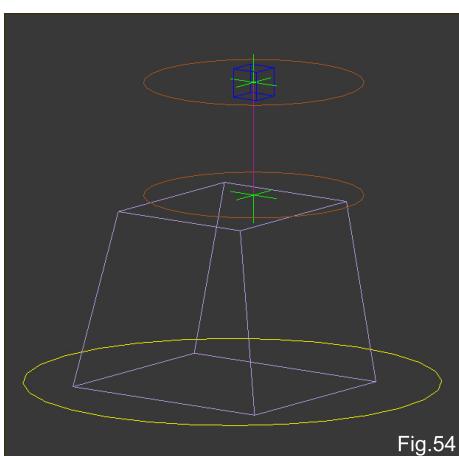


Fig.54

Then create a circle in top view and align and link it to place Alien\_C\_neck\_root\_DH. Name the circle Alien\_C\_neck\_SA.

3- Create a point and align and link to Alien\_C\_neck\_SA. The point will be named Alien\_C\_head\_root\_DH.

4- Place Alien\_C\_neck\_root\_DH in the beginning of where you think the base of the neck is going to be.

Afterwards create a circle in top view and align and link it to place Alien\_C\_neck\_root\_DH. Name the circle Alien\_C\_head\_SA (Fig.53)

Open Maxfile: 6\_alien\_NeckHead\_01.max to be in this stage.

5- Create the spline in with snap to pivot. Remember to setup the point to be Bezier, so we can have Bezier handle to manipulate the spline, which will be named Alien\_C\_neck\_spline\_SH

6- Create a point link and align to Alien\_C\_head\_SA and name the point Alien\_C\_head\_SK\_DH

7- Skin the spline to Alien\_C\_head\_SK\_DH and Alien\_C\_neck\_root\_DH (Fig.54)

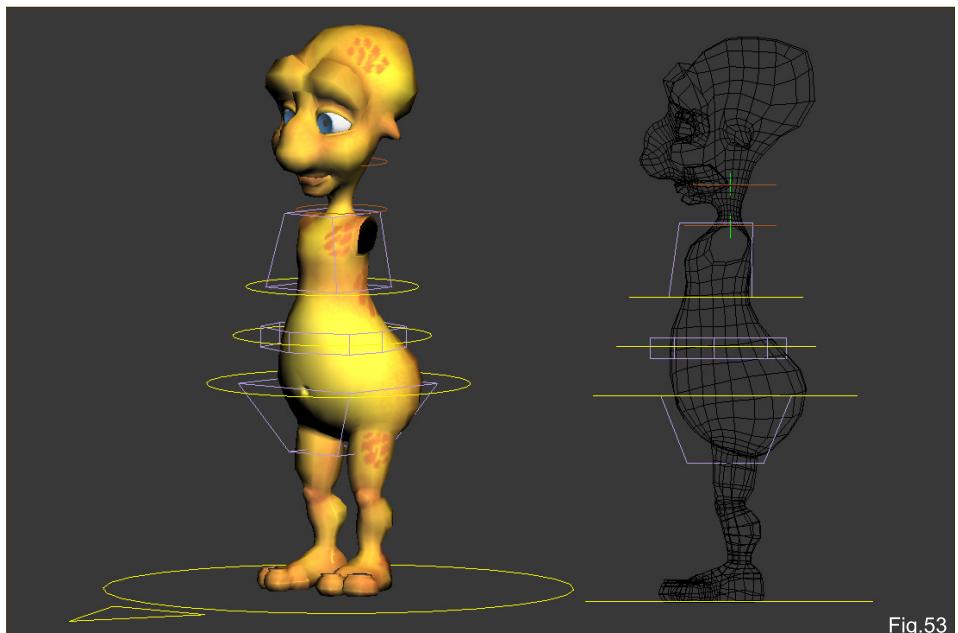


Fig.53

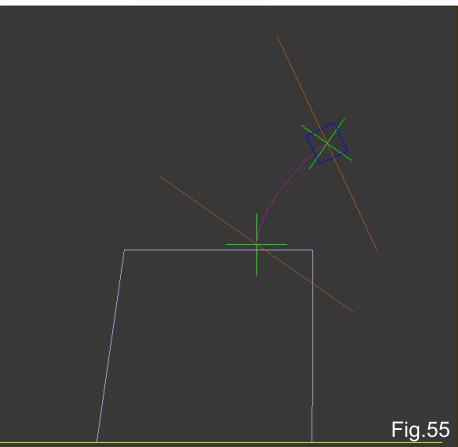
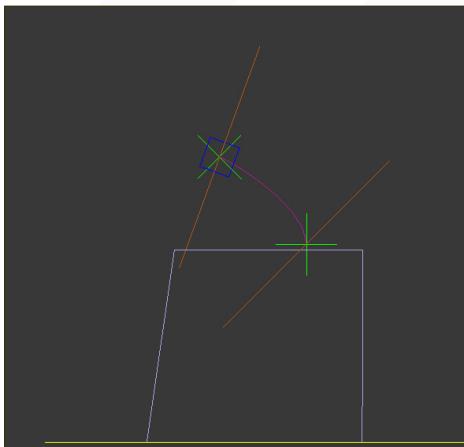


Fig.55

Open Maxfile: 6\_alien\_NeckHead\_02.max to be in this stage.

8- Rotate the neck and head control; the spline should do nice arcs.  
(Fig.55)

Open Maxfile: 6\_alien\_NeckHead\_03.max to be at this stage.

9- We are going to create a setup similar to the one we used for the spine bones.

We will create 4 bones and the bone end and 5 points moving on the path, but we can optimize and use **Alien\_C\_neck\_root\_DH** and **Alien\_C\_head\_SK\_DH** as the last and first points. This way we will only need to create 3 points that we will link to the master.

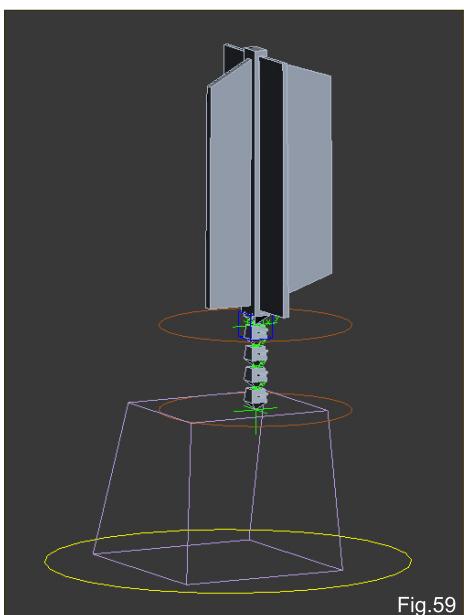


Fig.59

The points will be path constrain to the spline **Alien\_C\_neck\_spline\_SH**, the place in the path will be 25%, 50%, 75%.

Name the points **Alien\_C\_neck\_spline\_01\_DH**, **Alien\_C\_neck\_spline\_02\_DH** and **Alien\_C\_neck\_spline\_03\_DH** (Fig.56)

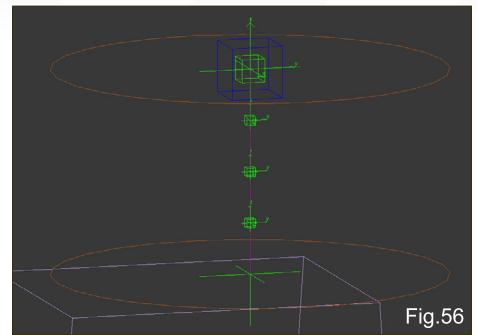


Fig.56

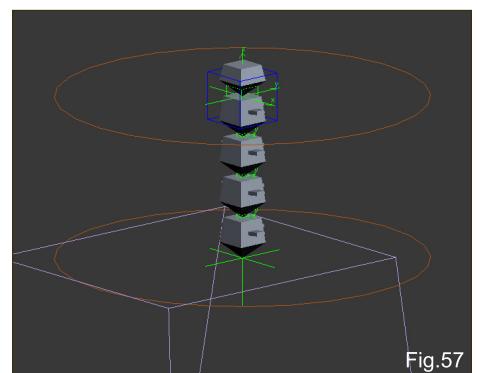


Fig.57

10- Create 5 bones and name them **Alien\_C\_neck\_01\_SK\_BH**, **Alien\_C\_neck\_02\_SK\_BH**, **Alien\_C\_neck\_03\_SK\_BH**, **Alien\_C\_neck\_04\_SK\_BH** and **Alien\_C\_neck\_end\_BH**, Use position constrain and look at with up nodes in the same way we setup the bones in the spine. (Fig.57)

11- Now the last step for the neck rig is to do the twist. To do that we want to capture the rotation Z of the neck and the best way is to create a point that we will name **Alien\_C\_head\_Zrot\_DH** and parent it to **Alien\_C\_head\_root\_DH**. Wire the Z rotation of **Alien\_C\_head\_SA** to the Z rotation of **Alien\_C\_head\_Zrot\_DHT**. This way we have only the Z rotation of the control but not the other axes.

12- We apply an orientation constrain to **Alien\_C\_neck\_spline\_01\_DH**, 75% to **Alien\_C\_neck\_root\_DH** and 25% to **Alien\_C\_head\_Zrot\_DH**.

We apply an orientation constrain to **Alien\_C\_neck\_spline\_02\_DH**, 50% to **Alien\_C\_neck\_root\_DH** and 50% to **Alien\_C\_head\_Zrot\_DH**.

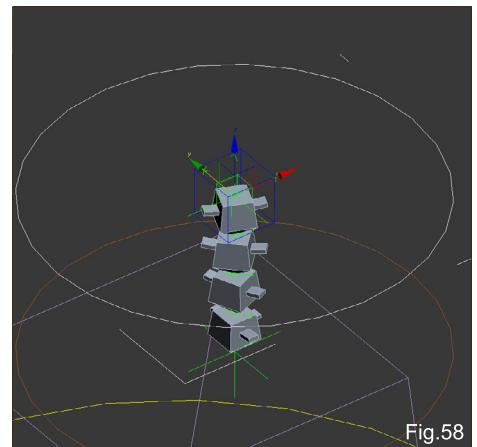


Fig.58

We apply an orientation constrain to **Alien\_C\_neck\_spline\_03\_DH**, 25% to **Alien\_C\_neck\_root\_DH** and 75% to **Alien\_C\_head\_Zrot\_DH**.

With this the neck will twist nicely. (Fig.58)

Open Maxfile: 6\_alien\_NeckHead\_04.max to be in this stage.

13- Create a long bone for the head and align and link it to **Alien\_C\_head\_SA**. Rotate it so that it points correctly.

Name the bone **Alien\_C\_head\_Sk\_BH** (Fig.59)

14- Cut the proxy mesh again and link it to the bones to finish the animation rig for the neck and head.

The names will be `Alien_C_neck_01_PF`, `Alien_C_neck_02_PF`, `Alien_C_neck_03_PF`, `Alien_C_neck_04_PF` and `Alien_C_head_PF`.

(Fig.60)

Open Maxfile: `6_alien_NeckHead_05.max` to be in this stage.

#### 6.4 CHECKLIST FOR RIGGING SPINE

Use the same list that we used to check everything was right when we finished the spine.

- 1- Proper names
- 2- Proper names for the layers
- 3- Objects in their correct layers
- 4- No object in layer 0
- 5- No duplicates names
- 6- Move the master and check all the meshes follow correctly
- 7- Controls have correct rotation orders
- 8- Limited key ability in controls and proper locks
- 9- Rotate and move the rig with auto key to check all is ok
- 10- Delete keys and leave a clean version for animators
- 11- Be sure IMR key tools zero all works properly

We will not see all the points above, only the most important.

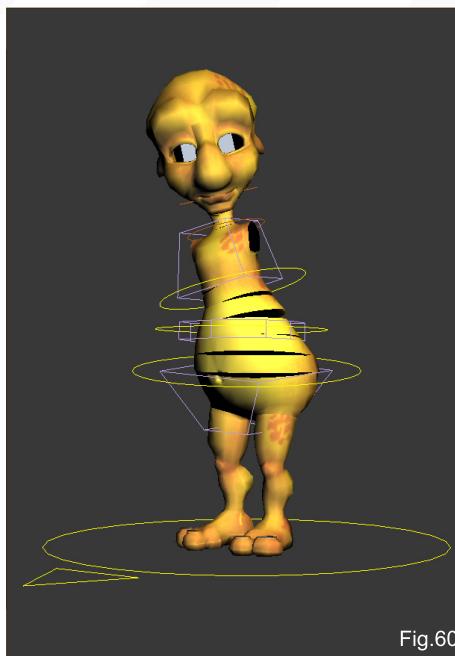


Fig.60

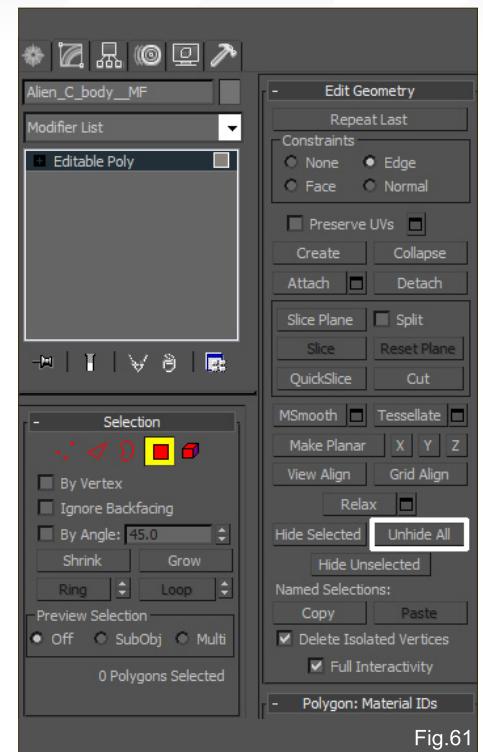


Fig.61

#### 3- Objects in their correct layers

Remember to use `*_H` to move objects to the hidden layers, `*_SA` to move objects to the controls layers and `*_PF` to move objects to the proxy layer

#### 8- Limited key ability in controls and proper locks

`Alien_C_neck_SA` is keyable in rotation and locked in position and scale  
`Alien_C_head_SA` is keyable in position and rotation and locked in scale.

#### 11- Be sure IMR key tools zero all works properly

Make sure IMR key tools zero all works properly with the controls.

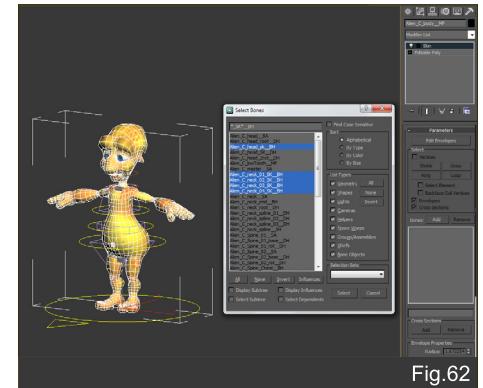


Fig.62

`_sk*_BH` because we had put `sk` in the name of each bone for the deformation, so it will be really quick to select the object.

As you can see naming convention is a great tool to select object by category.

(Fig.62)

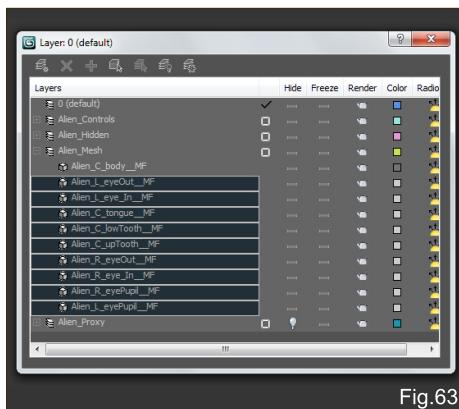


Fig.63

## 7 DEFORMATION RIG

### 7.1 SKIN

The first thing we do is to unhide all the polygons in the edit poly of `Alien_C_body_MF` in order to apply the skinning properly.

(Fig.61)

We start adding skin to the main mesh; instead of selecting the bones one by one we will use

For the rest of the objects in the layer `Alien_mesh`, we link them to the bone `Alien_C_head_sk_BH`.

In the next chapters we will rig them properly, but for now having them following the head bone will be less confusing when we do our deformation test.

(Fig.63)

Open Maxfile: 7\_Alien\_Skin\_01.max to be in this stage.

**Note:** to see better the weight of skin modifier, on the Command Panel display set the mode for shaded in object color and the color for the main body Alien\_C\_body\_MF in grey.

By default the initial weighting is done by envelopes, but because the shape of the character and the character is not high vertex, I recommend doing the weighting by vertex.

To avoid having the envelopes confusing our the screen, we can use the option inside the skin modifier on the category *Display / Show no envelopes*. (Fig.64 + Fig.65)

To continue weighting we don't need to have the *layer hidden* visible, so we can hide it and focus on the weighting, so we don't see objects that we don't need in the viewport. (Fig.66)

## Some tips for the weight tool:

- You can use the shrink, grow, long or ring to select vertices more quickly. To be able to select

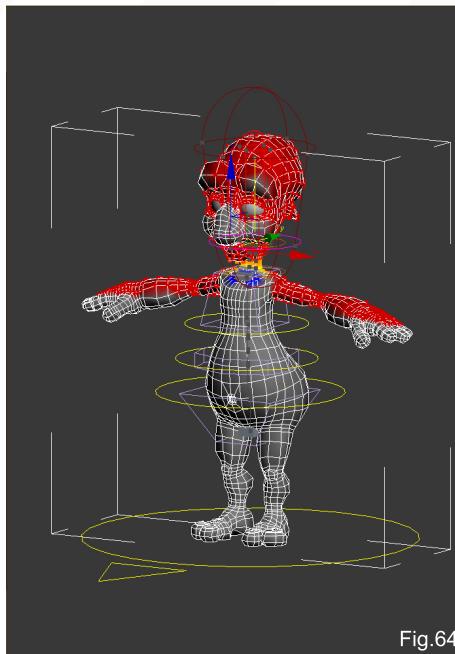


Fig.64

ring or loop you have to select two vertices that are together in the same loop or rig.

-To avoid selecting faces of the back, when you need it activate the *backface cull vertices* on the modifier panel inside *Skin*.

-On the bottom of the weight tool there is a list of the bones that influence each vertex you have

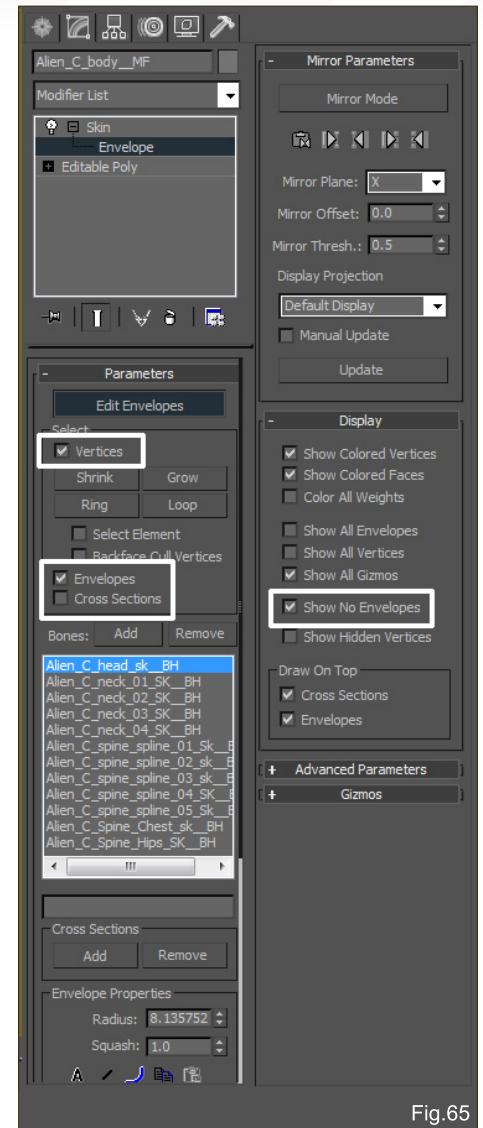


Fig.65

selected; if you select a bone on the list, it will move to that bone.

For a quick start, I recommend weighting each area 100 that you think will follow a bone; when two bone areas meet another bone weight 50 to one bone and 50 to the other. (Fig.67)

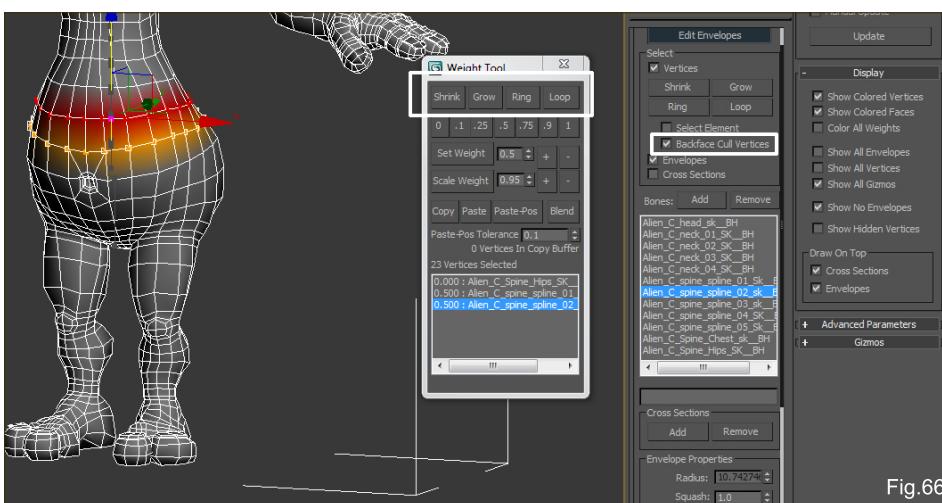


Fig.66

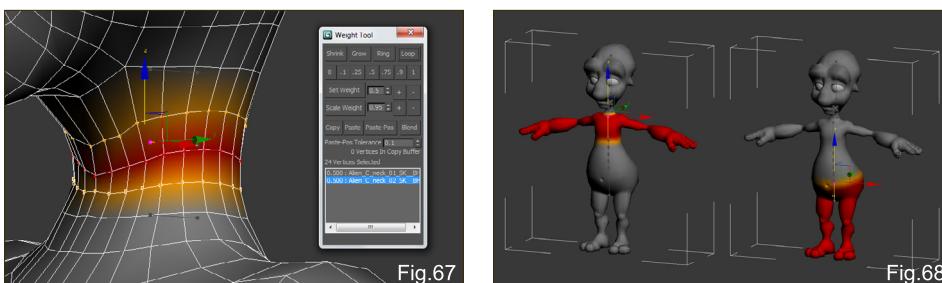
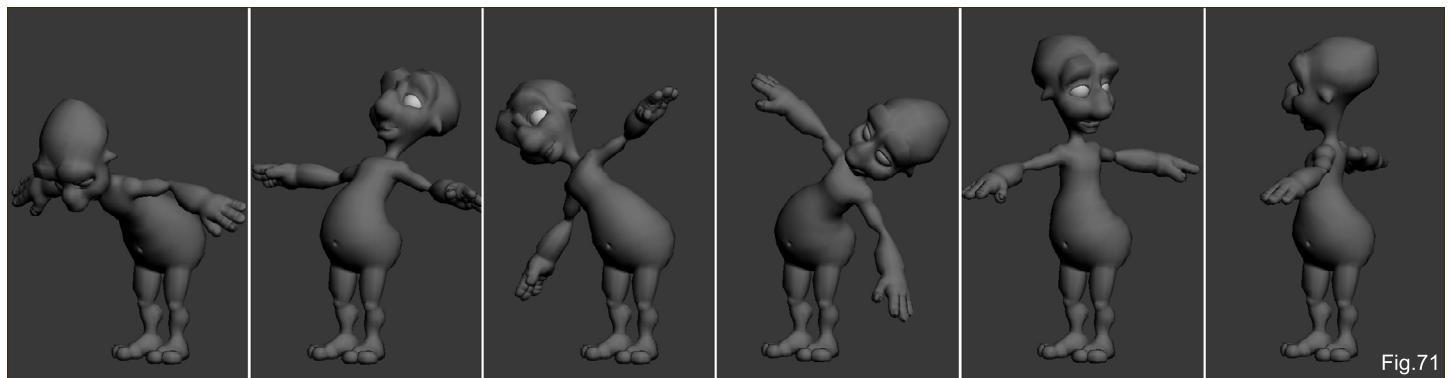
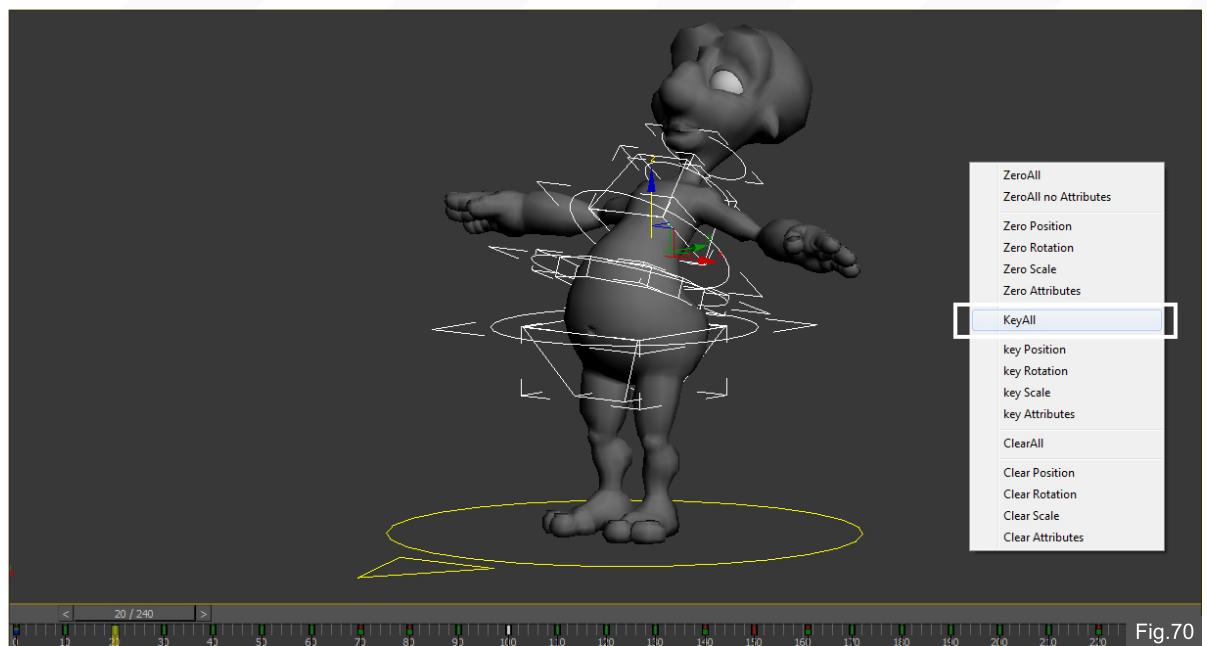
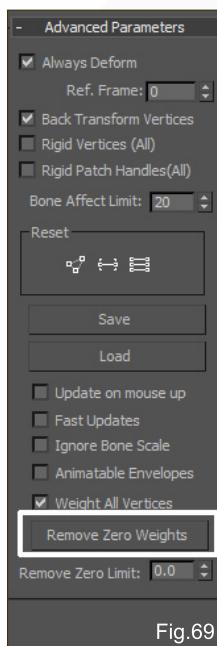


Fig.67

Because we haven't yet rigged the legs and arms I recommend weighting the hands to the arms and the chest bone and the legs to the hips bone. When we rig the legs and arms in the next chapters, we will add more object to the skin. (Fig.68)

Once we have all the bones weighted, we clean the skin. Normally in skin, we have vertices with bones that have 0 weight assigned, so using



advance parameter / remove zero weights we leave only the bones that are affecting the vertex. (Fig.69)

Open Maxfile: 7\_Alien\_Skin\_02.max to be in this stage.

Now we have the basic skin done, it is time to start doing an animation, to test how the skin behaves when we move the rig.

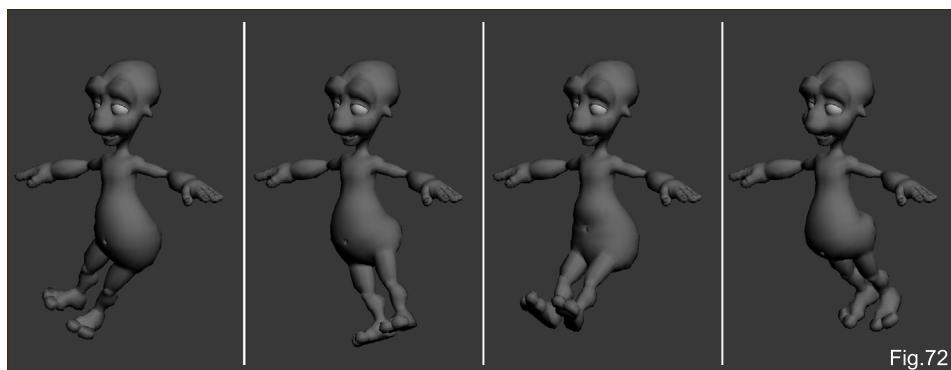
## 7.2 SKIN SPINE AND DEFORMATION TEST.

Before we start improving the skinning, we will create poses for each control to see how the skin reacts. Each pose is 10 frames after the previous pose. We test only one control at a time, so we can locate the deformation.

I prefer this system, so we don't forget to skin for any possibility. Having a few controls moved

at a time can make the tweaking of the skin a bit confusing.

**Note:** a good practice is to key all the controls in each poses to avoid strange in-between poses. We can with Max do normal procedures or we can select all the controls at the desired frame and using *IMR key tool* with the option *Key All* to put a key in each control object in each controller. (Fig.70)



Open Maxfile: 7\_Alien\_Skin\_03.max to see the animation move the time slider.

Once we finished the animation we can start improving the skin. Be sure that you move the time slider.

Spine control deformation (Fig.71)

Hips Control deformation (Fig.72)

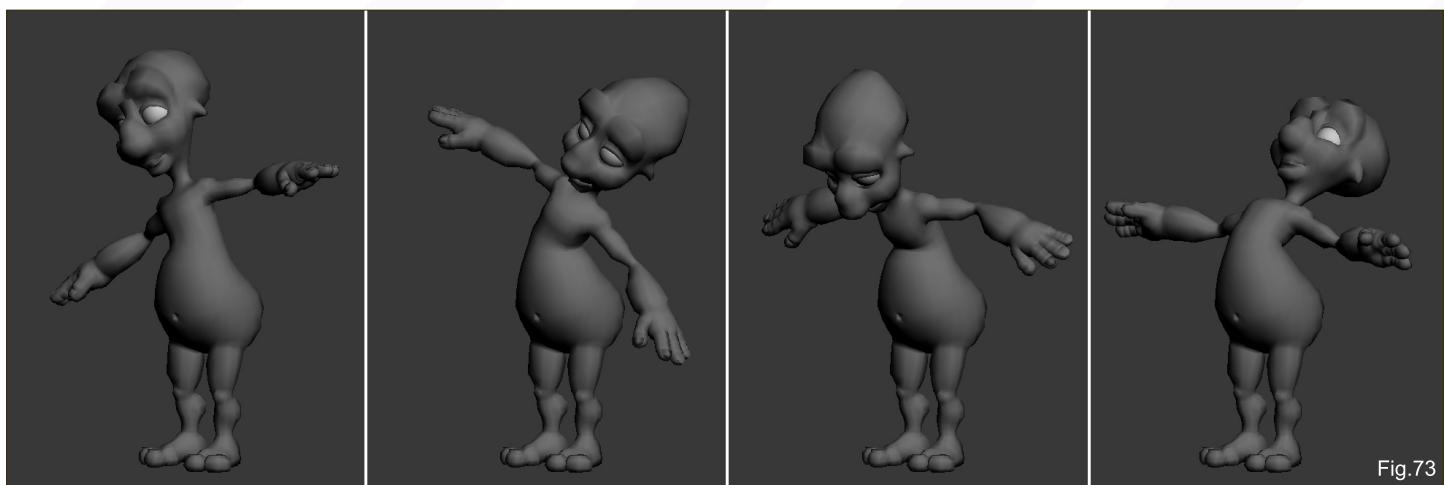


Fig.73

Chest Control deformation (Fig.73)

Open Maxfile: 7\_Alien\_Skin\_04.max to see the animation and the skin tweaked.

## 7.3 SKIN, NECK AND HEAD DEFORMATION TEST

We will do the same as we did with the skin of the spine. We pose each control in a different pose every 10 frames.

Open Maxfile: 7\_Alien\_Skin\_05.max to see the animation move the time slider.

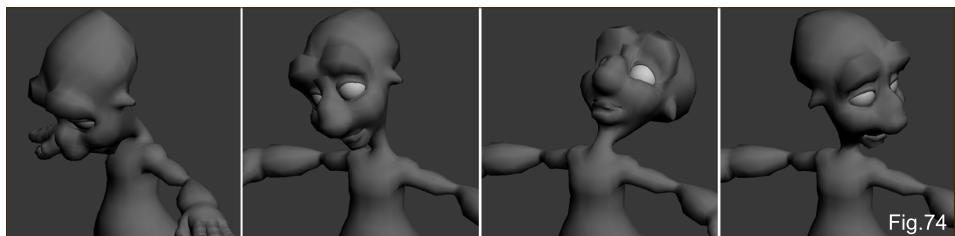


Fig.74

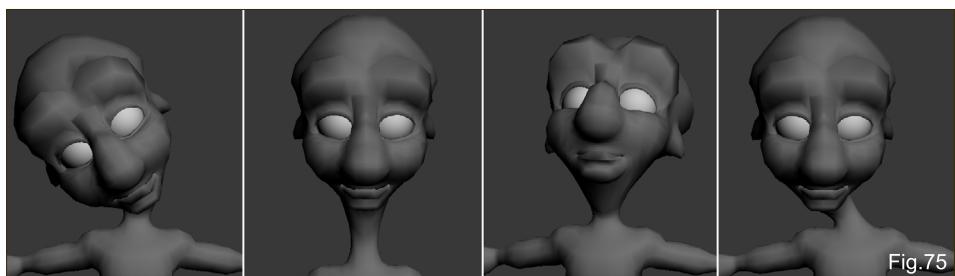


Fig.75

And later we will tweak the skin

Neck control deformation (Fig.74)

We must leave a clean file to continue in the next chapter.

Head control deformation (Fig.75)

To do so we have to erase the animation of the controls; we can do with Max normal procedures or we can select all the controls at frame 0 and using *IMR key tool* erase the keys with the option *Clear All.* (Fig.77)

Finally open Maxfile: 7\_Alien\_Skin\_06.max to see the animation and the skin tweaked.

## 7.4 FINAL TWEAKS

Now that we have skinned properly the spine, neck and head, we can put back the shaded mode in material color.

And finally add a *turbo smooth* modifier on top of the skin to see how the mesh will look subdivided. (Fig.76)

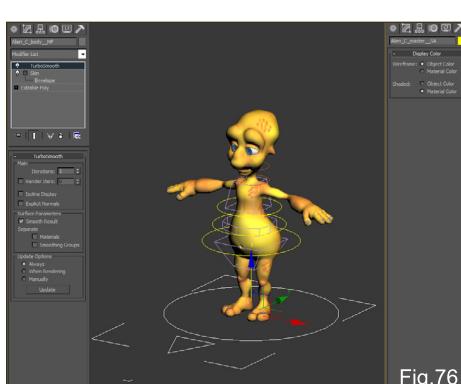


Fig.76

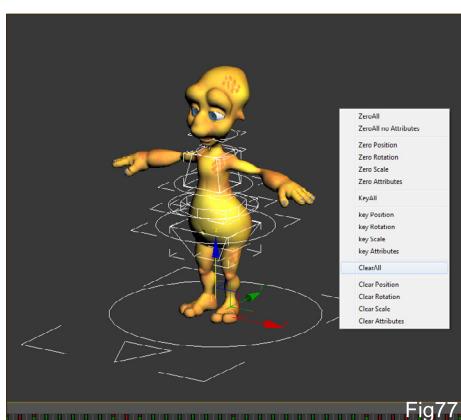


Fig.77

Open Maxfile: 7\_Alien\_Skin\_07.max to be in this stage.

Move the time bar to see the final result.

**LUIS SAN JUAN PALLARES**

For more from this artist visit

<http://www.luis-sanjuan.com>

or contact

[luis@luis-sanjuan.com](mailto:luis@luis-sanjuan.com)

CHAPTER 1 | APRIL ISSUE 056

Planning your Rig

CHAPTER 2 | MAY ISSUE 057

Knowing your Tools

CHAPTER 3 | THIS ISSUE

Rig Creation – Part 1

CHAPTER 4 | NEXT ISSUE

Rig Creation – Part 2

CHAPTER 5 | AUGUST ISSUE 060

Facial Rigging

CHAPTER 6 | SEPTEMBER ISSUE 061

Scripting



# INTRODUCTION TO RIGGING

The aim of these tutorials is to show and explain how you might tackle rigging your 3D character for animation. These tutorials will give help and advice to novices and experts who are looking to build on their rigging skills or approach rigging for the first time.

The series gives a detailed step by step guide as to how to approach rigging but also shows us how to tackle common problems and issues that regularly occur even in a professional environment. The artists will be reflecting on working in the industry as well as talking us through their individual approaches to creating the best rigs possible.



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## INTRODUCTION TO RIGGING: 3 - RIG CREATION - PART 1

Software Used: Maya

### CHAPTER OVERVIEW

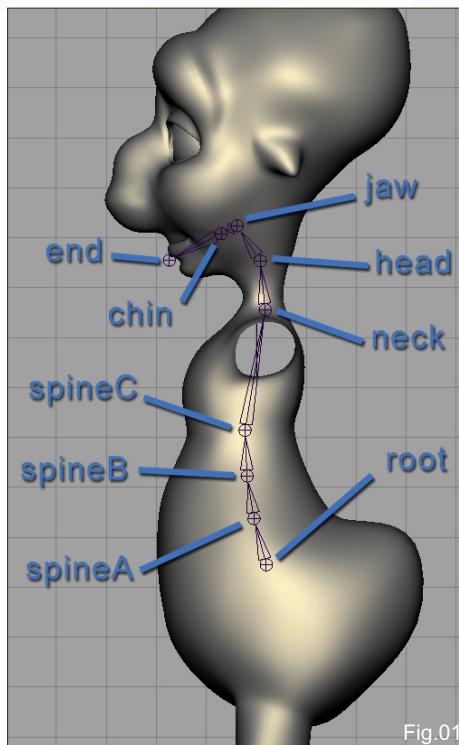
This time we are finally getting down to business! We will start to create the skeleton hierarchy of our character while giving a deeper explanation to the skinning process. At the very end, we will take a peek on some blendshape targets for our ET character. Enough said, let's rig!

### JOINT OUTLINING

Now it is time to use our planned material from previous lessons to create the character's skeleton. Use the side, front, top and persp viewports to create these structures:

**Spine:** the root joint of a biped character must be the first lower spine, the waist. From then on you will need to create up to three joints until the chest area. Name them as *spineA\_jnt*, *spineB\_jnt* and *spineC\_jnt*. After that build another five joints for the *neck\_jnt*, *head\_jnt*, *jaw\_jnt*, *chin\_jnt* and *chin\_end*. (Fig.01)

**TIP (joint Ends)** = We do not use the joints suffixed “\_end” as skinned influences. We only create them to help us visualize the rotation of



the last joint in the hierarchy and for helping Maya calculate the starting skin weights.

**Leg:** now we can start with another separated joint hierarchy from top to bottom, but this time we will concentrate only on the left side because we will mirror the limbs from left to right later on. So, create six joints named as following: *l\_leg\_jnt*, *l\_upKnee\_jnt*, *l\_lowKnee\_jnt*, *l\_ankle\_jnt*, *l\_foot\_jnt*, *l\_foot\_end*. Note the “*l*” prefix, that means left side. We will replace that for “*r*” when we mirror these and other limbs.

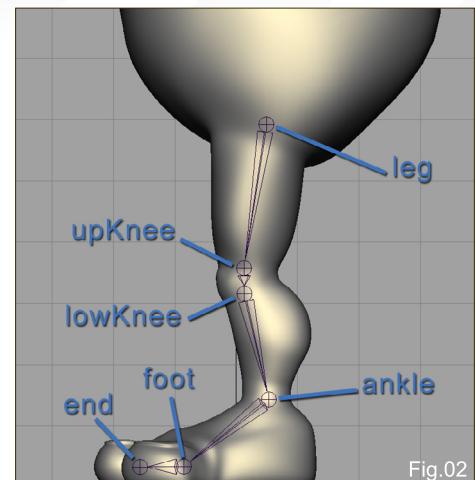


Fig.02

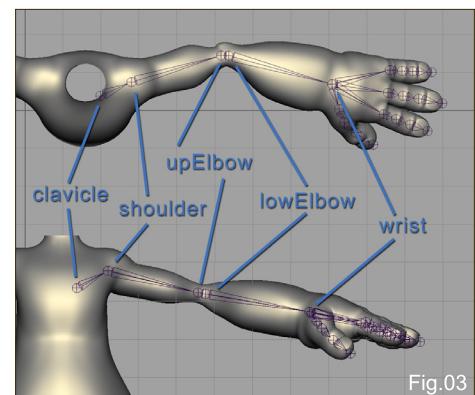
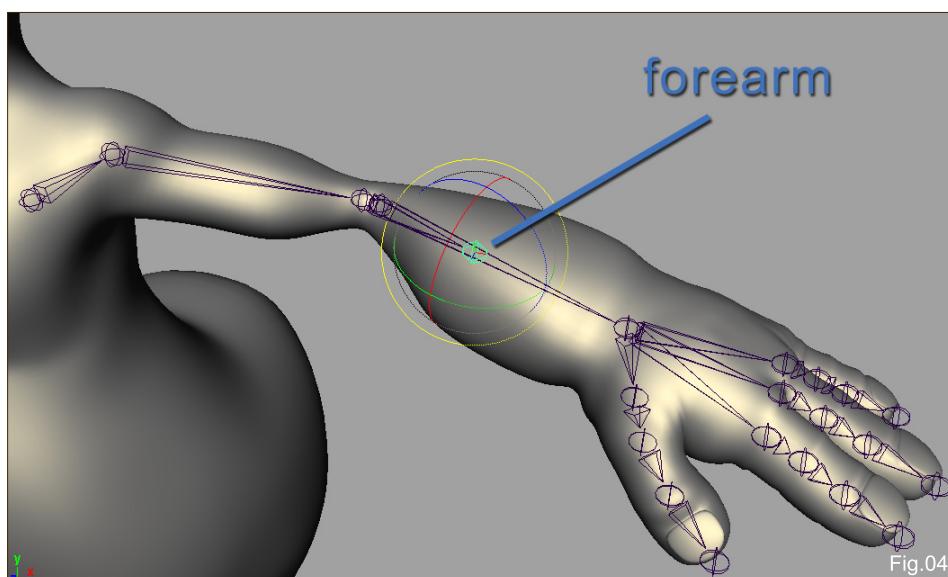


Fig.03

**TIP (knee/elbow)** = We use two joints as knee (or elbow) in order to get better deformations. These parts are very complex in real-life, so we need two joints to reach almost 180 degrees of rotation while minimizing volume loss. (Fig.02)

**Arm:** for the arms we will use five joints that can be: the *l\_clavicle\_jnt*, *l\_shoulder\_jnt*, *l\_upElbow\_jnt*, *l\_lowElbow\_jnt* and *l\_wrist\_jnt*. (Fig.03)



**TIP (Forearm Twist)** = This technique is for a simple forearm twist: duplicate the wrist joint (Any Mode >> Edit > Duplicate) and move it along the chain (in our case, the X direction) until it is 1/3 of the distance of the low Elbow. Rename it as *forearm\_jnt* and delete its child wrist joint.

This is a simple yet very useful way to mimic the forearm twisting, when we rotate our hands. For now we won't actually be setting the forearm rig, we will take a look into its expression in the next chapter! (Fig.04)

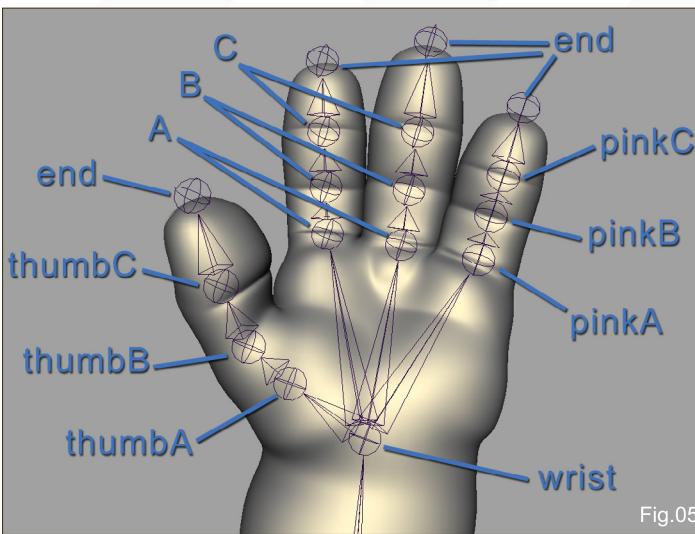


Fig.05

**Hand:** let's create four joints for each finger, such as: *I\_thumbA\_jnt*, *I\_thumbB\_jnt*, *I\_thumbC\_jnt*, *I\_thumb\_end*. Parent finger joints to the *I\_wrist\_jnt*. (Fig.05)

## MIRRORING

Now, we can parent the clavicle joint to the spineC and then do the mirroring using (*Animation >> Skeleton > Mirror Joint*). Look at the options for this command, we should search for “*I\_*” (left side) and replace for “*r\_*” (right side) while mirroring in YZ mirror across. Do the same for the *I\_leg\_jnt* parented to the waist. (Fig.06)

## SKINNING THEORY

Ok, in a moment we will start the skinning process to actually drive our mesh using our created joints - but before that we need to understand what this is all about. We will be using the *smooth bind* command, it allows you to deform a mesh using one or more joints by creating a skinCluster deformer in your mesh. “Smooth” means that you can have more than one joint driving the position of a single point of your mesh. So the skin Cluster lets joints drive points in a mesh and for each point the rules for which the joint is to follow is completely open for us to edit (either by numeric values or painting the values directly in the mesh).

**TIP (Skinning)** = Reset joint rotations before applying the skin Cluster. To do this preserving your joint hierarchy, select all joints and use

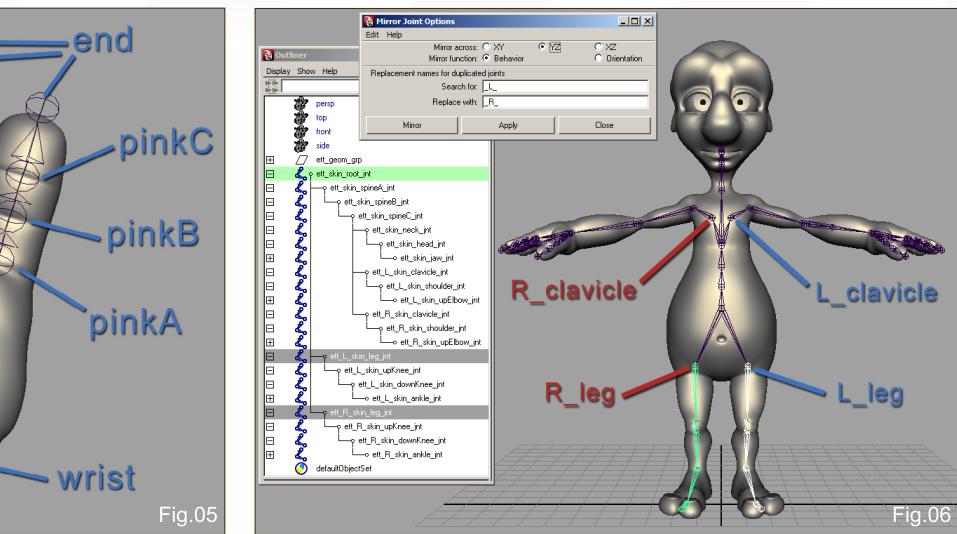


Fig.06

the command (*Any Mode >> Modify > Freeze Transformations*). This way you will be able to return to the default joint positions (bind pose) when you paint skin weights.

## SKINNING IN ACTION

Now let's put these joints into action! Freeze the joints transformations, select your model and all of your joints except those named “*\_end*” and apply the Smooth Bind Skin by going to (*Animation >> Skin > Bind Skin > Smooth Bind*). Go to the option box and mark these options: Bind to Selected joints, Max influences 3, Maintain Max Influences off. Maya will then create a default skinCluster with point weight values that we can refine using the artisan brush (*Animation >> Skin > Edit Smooth Skin > Paint Skin Weights Tool*).

When you look the mesh with this tool activated, you will see that it is painted black, white and gray. Do not worry, it is all right. These colors are showing you the weights values for joints (black = 0, white = 1 and gray = values between 0 and 1). This means that: the whiter the region is, the more the currently selected joint will affect your mesh.

With this tool, we can replace, add, scale or smooth influences for each deformer joint. The button “Toggle Hold Weights on Selected” can be used to lock the selected joint for modifications and the button “Flood” paints all

vertices with the command and value currently set for the selected joint.

A technique that we use is to repaint all of the character model again. It may seem hard to do sometimes, but this way you can get better results instead of trying to repair the original skin weights generated by the software.

Let's do this by activating “Replace” paint mode with the Value of 1 for the *waist*! After you block it, also paint value 1 for *spineA* to all faces of the mesh that are above this joint. When you have the two white blocks, hold the weights of all other joints except *spineA* and *waist*.

Now press 3 or 4 times the Flood button with the “Smooth” option selected. Look at what you should have: a nice smooth blending between these two joints while the other joints do not influence this area - they were held. Continue by holding the *waist* joint and unholding *spineB*, then block influences between *spineA* and *spineB* areas, lock and smooth. Repeat this process for all adjacent joints. (Fig.07)

**TIP (skinning)** = You can rotate joints when painting to see if your weights are good. When you are finished, just reset their rotations to zero!

Concentrate in painting the skin values for only one side of the character, as we can



mirror weights from one side to another using (*Animation >> Skin > Edit Smooth Skin > Mirror Skin Weights*).

## SECONDARY DEFORMATIONS

If you want to get better deformations while animating your character, you should create secondary deformations as corrective blendshape targets to simulate muscles and interactive anatomy that will be automatically controlled.

This technique is simple: just duplicate the original model and deform it to what you need, when you use it as a target then link its blendshape slider to a controller. We usually connect the rotation of a specific joint to values of the blend shape slider using *Set Driven Keys* (*Animation >> Set Driven Key > Set...*).

Let us see an example. Look at the picture to get the idea: **(Fig.08)**

Here we created an inflated biceps blendshape. This target is controlled by the *lowElbow* joint's rotation Y value. We then use SDK to tell Maya: when the rotation Y of the joint is 0, the value of the slider of the blendshape is also 0. When the rotation Y of the joint is -30, the value of the blendshape will be 1. Simple, isn't it?

**TIP** (secondary deformation) = Always think in volume preservation. You can use secondary deformations in any part of the character that you need. So try to do it for the main muscles of your character like elbows, knees, belly volume, etc.

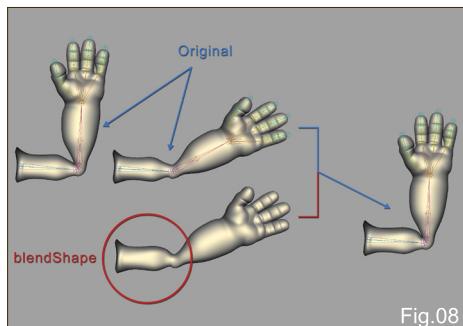


Fig.08

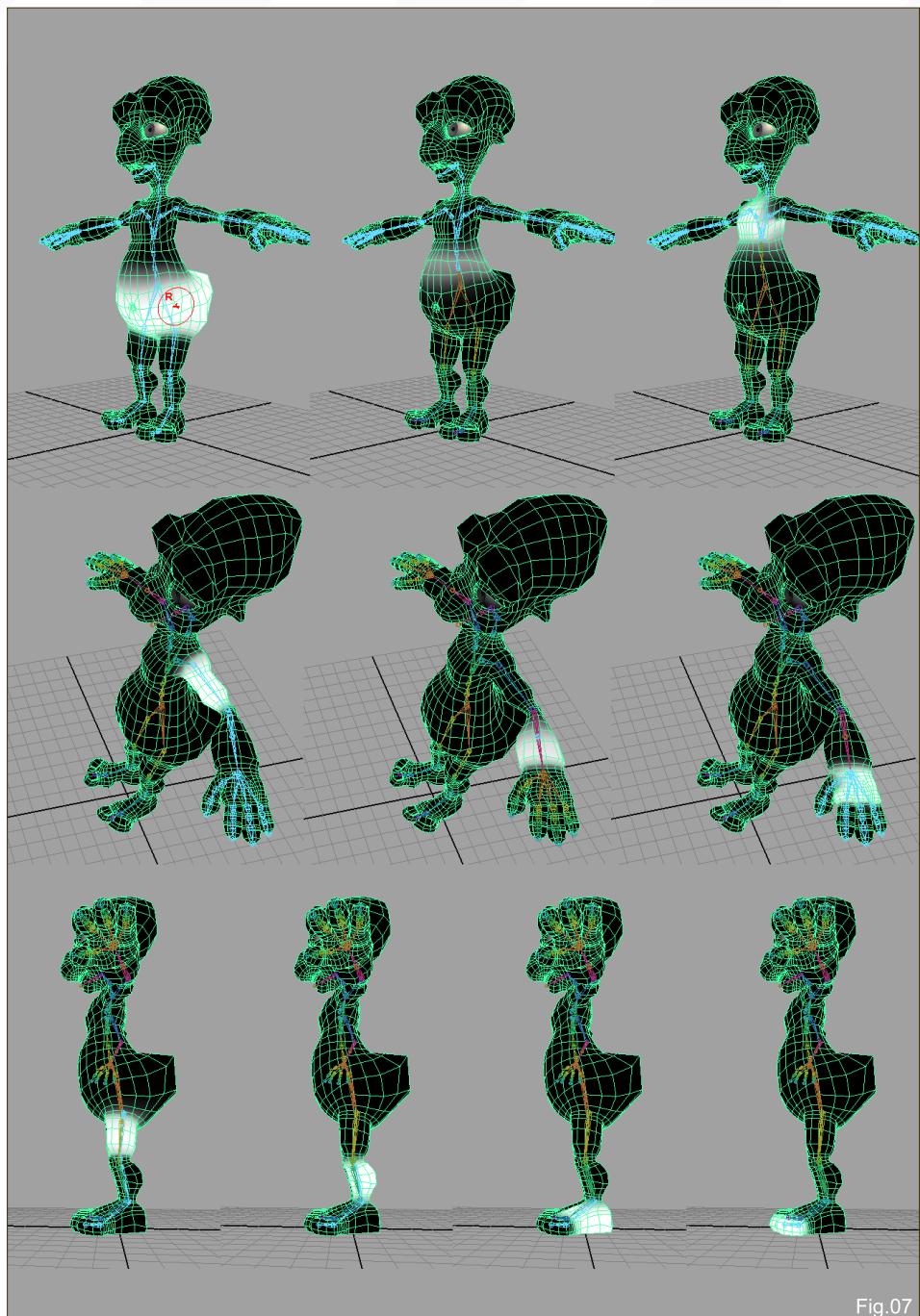


Fig.07

That is it for this lesson! Try to skin the joints in different positions to better understand how the smooth skinning works in order to get the best deformations possible! Also model and test a lot of targets for your character to learn this properly! These are valuable assets in any rigger's workflow, remember that! :)

Now that the entire joint hierarchy is created and the skin weights are nicely adjusted, in the next chapter we will see some rigging tricks to create IK/FK blending, reverse foot controls, forearm

twist and create the actual controllers that the animators will use. See you then!

**RICHARD KAZUO & DANILO PINHEIRO**

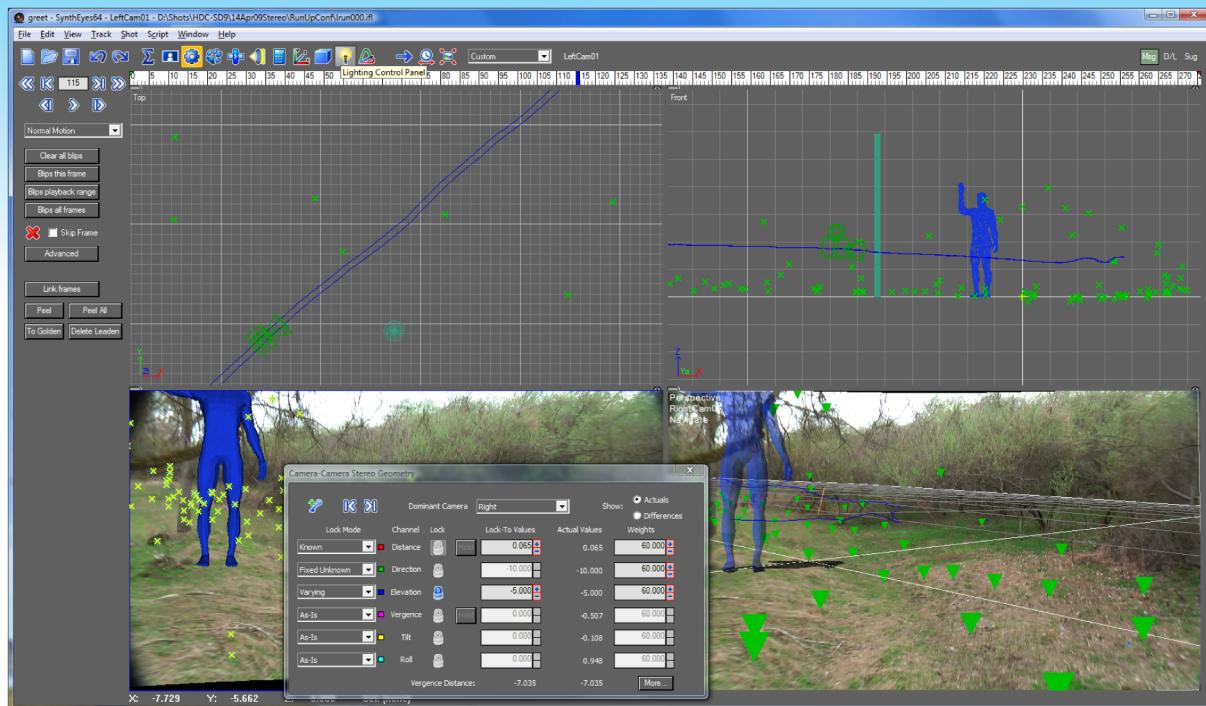
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# JUDGE DEATH

## MAKING OF

Here you can see Belarusian Character Modeler Petr Nasirov explain the process used of create his prize winning comic character image "Judge Death" ...

"WHEN I SAW JUDGE DEATH I INSTANTLY THOUGHT, "I WANT TO MODEL THIS CHARACTER" BECAUSE HE LOOKED INTERESTING, UNUSUAL AND FUN."



## JUDGE DEATH

Software Used: 3ds Max & ZBrush

Hi there, my name is Petr Nasirov. I'm a 24 year old character modeler from Belarus.

"Judge Death" was created for the game art challenge Comicon'09 and it won 1st place. Before starting I spent about 2 days researching comic characters. When I saw Judge Death I instantly thought, "I want to model this character" because he looked interesting, unusual and fun.

## REFERENCE SEARCH

Searching for references is one of the most essential stages. The more time you devote to studying the features of the character, the fewer mistakes you will make. At this stage you need to study all the detail of the character's structure and the design and material of his clothes, to figure out whether everything is functional and comfortable. Character creation is a complex multistage process. If you find a mistake near the end of the process it will take much more time to correct it. If worst comes to worst you will even have to modify the high and low-poly models, and the textures.

Regarding the modeling of the Judge Death, I took advantage of all the references I managed to find on the internet using the Google search

engine. There is a great variety of designs of Judge Death, some of their elements appeal to me, some not. One poster became a reference for a hand as I liked the details and color. Another poster gave me an idea for the bird on the character's shoulder. The combination of Judge Death images helped me to create my own version of the character. The more reference I found the more detailed my version of the final character became.

## BASE LOW-POLY MODEL

After studying the references that I had gathered, I got down to creating a base low-poly model. Primarily this stage is necessary to reveal the right proportions of the character and to define a general silhouette. At this stage I use the standard 3ds Max materials to set different colors to the model elements. This helps me to see not only the silhouette, but also the combination of the brightness of the different elements (Fig. 01). From this early point it is more convenient to work with a low-detailed model. You have to focus on ensuring the silhouette is correct.

After I am happy with the silhouette I proceed to the next stage: high-poly modeling. When preparing a model to export to ZBrush, I create a high-poly model with no detail in 3ds Max by means of the modifier Turbo Smooth (Fig.02).



Fig.01

Pleats on clothes and folds on bodies, and small details like this should be made in ZBrush.

## EXPORT TO ZBRUSH

When the high-poly model without details is ready, I delete the modifier Turbo Smooth and export the model in .obj format selecting the ZBrush Preset in 3ds Max 2009 (Fig. 03). For convenience I export the model to ZBrush in parts with the help of the command "Export selected", when the parts are symmetrical I delete the halves.

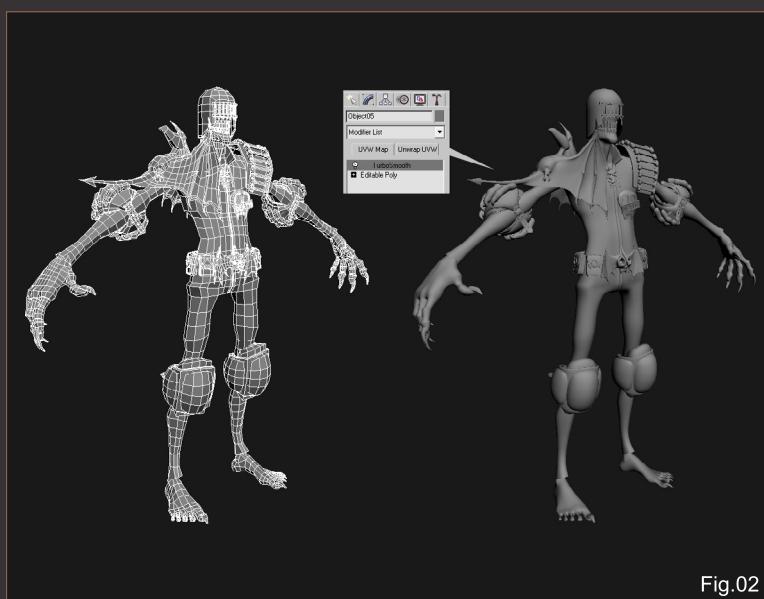


Fig.02

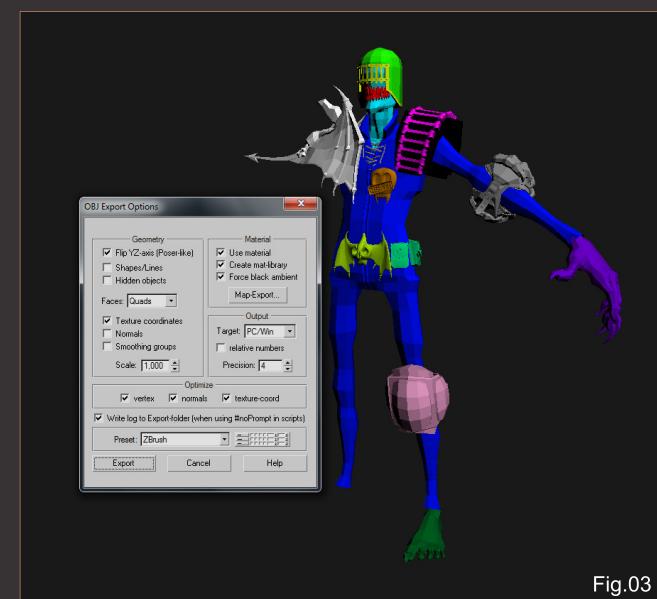


Fig.03

## HIGH-POLY MODEL

Next I create a high-poly model in ZBrush. Here I gather the model in the parts which it has been exported from 3ds Max. Each part is placed to a separate sub tool which makes it easier when high-poly modeling. (Fig. 04)

Usually I start working on the high-poly model from the 1st level of SubDivides and try not to



Fig.04



Fig.05

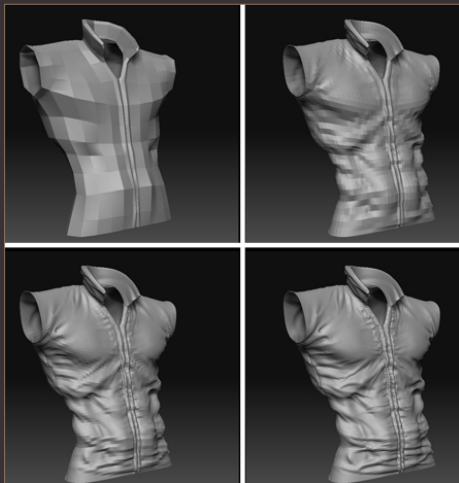
proceed to the next level until I am sure the current level is detailed enough. This enables control of the mesh and smooth lines. (Fig.05)

When modeling I often use the Standard brush with no alpha. If I want to sharpen the edges or improve the small details then I add Alpha 39 (Fig. 06). When finishing the modeling I can modify some edges with the Pinch brush to achieve a higher level of sharpness (Fig. 07).

Also I like to work with the Clay Tubes Brush. This brush creates different organic objects with a complex friable surface.

When modeling I as often as possible turn to my references. For instance if I want to draw pleats on clothes I search for some photos, select the most interesting fragments and carry them to the model. The character becomes more alive when the modeler uses references.

Adding the colors on a high-poly model in ZBrush helps you to imagine the final result. If



the model has UVW the Polypaint can be moved to the diffuse texture. To activate the Polypaint one need to carry out some simple actions: press the button Colorize on the tab Texture of the Tools panel. Then uncheck Zadd and Zsub on the upper panel of tools and press the button "Rgb". A color can be selected from the upper menu Color (Fig.08).



Fig.07

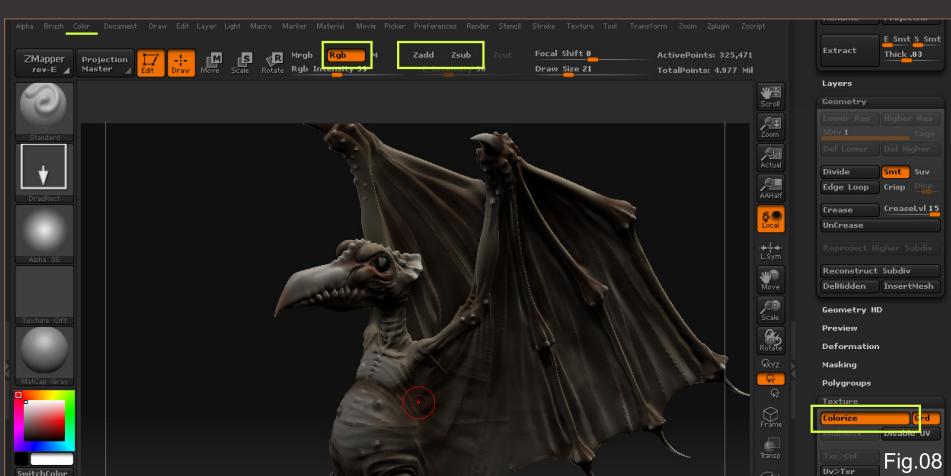


Fig.08



## FINAL LOW-POLY MODEL AND UNWRAP

When the high-poly model is completed, I create a low-poly model again but with the resemblance to the high-poly model by means of the program TopoGun. This program operates with high-poly objects and has an easy-to-use toolset to create low-poly models from the high-poly ones.

Each detail is created separately. Each high-poly element is opened in TopoGun and replaced by a low-poly one (Fig.09). Then all the parts are put together in 3ds Max where the low-poly model is being improved considering the limitations on the polygons number.

When unwrapping I use Unfold3D. In 3ds Max the model is divided into parts as it is before exporting to ZBrush, each part is separately imported to Unfold. Here I indicated the edges which will have the borders of UVW layouts, (orange lines on Fig.10) the program will then automatically unwrap the model. Then all the parts are put together in 3ds Max into one mesh and a general unwrap of the model is created. In order to place all the layouts tightly one should start with the grouping of larger parts and

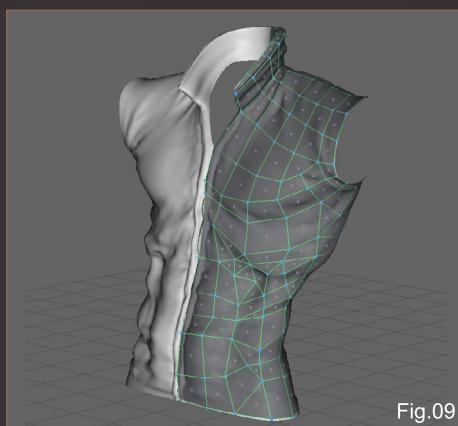


Fig.09

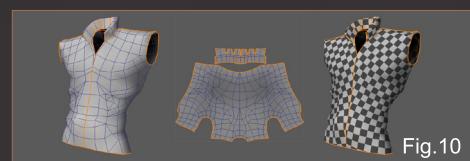


Fig.10



Fig.11

then proceed to gradually cover the free zones with small parts. To save space the symmetrical parts are combined. (Fig.11)

## NORMAL MAP

A normal-map is the first texture I create. I like to render textures in 3ds Max. It allows manual correcting of the cage and after rendering I get a normal-map of high quality which almost does not need improving.

Like the previous stages we work with parts of model. We open the high-poly element and its low-poly version in the scene. Sometimes I apply the modifier push with a small value to a low-poly model to increase a low-poly in size when rendering the normal-maps.



Fig.12



Fig.13

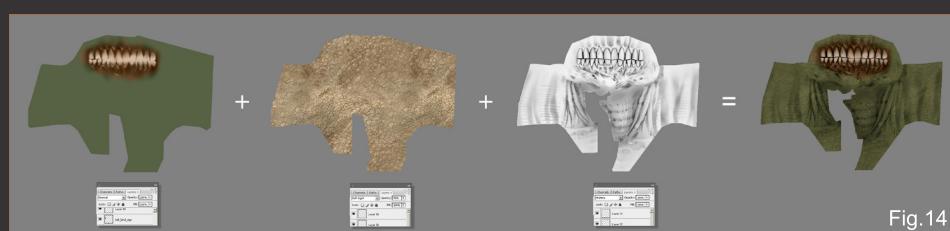


Fig.14

When all the parts of the normal map are rendered the final general texture is created for the character and the normal-maps are tested. It would be better to test the character in the scene with the final lighting. To test the normal-maps quickly I use DirectX shader: Xoliulshader which can be found on the Internet.

## DIFFUSE MAP AND SPECULAR MAP

When the normal-map is ready I proceed to create the textures for the ambient occlusion. It is necessary to supplement the shadows of the normal maps. This is the basis of the diffuse textures. For my character the ambient occlusion textures were created by means of baking the lighting from the high-poly model to low-poly, using the program xNormal. The lighting was baked for each part separately with the following settings: (Fig.12).

(Fig.13) This texture is laid in Photoshop with the Multiply mode on the layer, with the colors and texture to create shadows. The highlights are a result of the specular maps. I don't create them in the diffuse textures so the character has highlights only in places where the light falls. The base diffuse texture is created by mixing AO (Ambient occlusion) textures, color and texture (Fig.14)

The specular map is created from the diffuse textures by desaturating and increasing the contrast. On mat surfaces (for example fabric) the texture is made with less contrast, on the bright surfaces (metal) the contrast is increased.

Starting at this stage I improve the textures by thinking about the final scene render. (Fig.15)

## CONCLUSION

I hope you've enjoyed this making of and perhaps you've even learnt a few tricks. If you have any questions, please don't hesitate to contact me via email. Thanks for reading!

## PETR NASIROV

For more from this artist visit

<http://www.5k3d.com>

or contact

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Fig.15

# DIGITAL ART MASTERS VOLUME 4



With the release of 3DTotal's latest book, *Digital Art Masters: Volume 4*, we have some exclusive chapters for you...

This book is more than just an artwork book. Not only does it feature full-colour, full-page images, but each artist has given a detailed description, in their own words, of the creation process behind each piece of published artwork. And they've done it especially for this book!

This month we feature:

## "FLY TOGETHER"

BY WEIYE YIN



The following shots of the “Fly Together” book pages are featured here in full-resolution and can be read by zooming in...



## FLY TOGETHER

BY WEIYE YIN

SOFTWARE USED: 3d Studio Max, DeepPaint 3D/BodyPaint 3D and Photoshop

### INTRODUCTION

The inspiration for *Fly Together* came from an aged wooden toy; my original inspiration for making this image came from reminiscing about my childhood. Toys in my childhood were usually made of wood or sheet-iron; simple structures and bright colors. Compared with the modern toys of today that are varied and offer many methods of play, they were clumsy and of weak playability. Children therefore, at the time, often invented games by themselves, for example using puppets attached to string that they waved about, chasing one after another. Painted puppets became obsolete over time; playmates from childhood go in different directions and pursue their own dreams. This is what this particular artwork represents: they are flying, in different directions – still smiling, but with aged faces; only a line links them all; they seem to be free and happily chasing, but the concept also implies an element of constraint and helplessness.

### THE SKETCH

As time has flown by, both puppets as objects and photo references of them have become difficult to find, and so I created a sketch for this project using just a blurry memory (Fig.01). To complete the design in 3D seemed fairly easy. The basic shape of the puppets is cubic, their

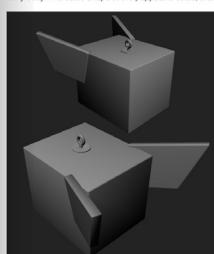


Fig.01 colors are simple, and their types are similar, so there is little technical content in the making of these little characters. However, because of the overly simple shape of these objects, it becomes very difficult for the work to attract the viewer's attention, so this had to be taken into consideration here.

So how do you attract the viewer's attention with such a simple concept? A successful work needs to consider many aspects, represent details, and bring together a common understanding within the audience. All of this requires much thought and investigation before starting the modeling of any design.

### MODELING & TEXTURE DESIGN

Platform toys (or canvas toys), which are very popular at present, gave me plenty of inspiration for my puppet characters in this artwork. Platform toys are blank canvases

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279

# DIGITAL ART MASTERS

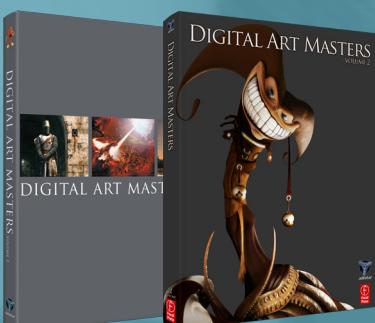
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that incorporate patterns and designs of different topics on plain colored surfaces; they come in different types but their differences are created purely in the process of their coloring and in their patterned exteriors. A key characteristic of a platform toy is its simplicity, and it was this element that I wanted to bring into my own artwork and puppets.

To start things off in 3D, I began modeling according to my original sketch (Fig.02). To suit textures of different styles, the model had to remain as simple and neutral as possible, and I stayed aware of the fact that I was not to add any detail that would create any kind of ‘personality’ in the model.

Moving on to untexturing the UVs, according to the sketch the angle of view of the final render would show the major faces at the front. Faces other than the back and bottom (the green areas in Fig.03) should therefore have evenly spaced UVs (this method can only be used in static works). The reasonable layout of UVs was also helpful for when I came to change the texture designs afterwards.

I created the first base texture according to the UV layout (Fig.04), and I created the complete set of base textures for the other puppets in the same way (Fig.05). My texture designs were consistently simple with distinct personalities, using single colors for large areas. This was not only easier for the connection of patterns, but it was also easier to distinguish the characteristics of the different puppets.



Fig.02



Fig.03

I painted the effect of dropped, spilled paint onto a wooden texture to create an overlay layer for my base textures. Painted wooden surfaces will wear, and so I also painted some concentrated areas of striped paint at the edges, emphasizing the worn edges and connections using DeepPaint 3D or BodyPaint 3D (Fig.06).

ATMOSPHERIC RENDERING & POST-PRODUCTION

Models and textures are the most basic elements of any static artwork. So how do you make a work full of vigor? Well the details of main objects alone are not enough, there should be corresponding atmosphere also.

To simulate the wide angle effect of a fish-eye lens, I arranged the puppets in their positions randomly, to create the feeling of them flying forwards at different angles and distances apart. The most forward puppet is the leading actor, and the other puppets are the supports and positioned according to this structure. Each puppet has its own color; the striking balance between the different blocks of color in the image makes the a bump map as well.

Considering the downward angle of the models, I chose a photograph of a hallway with a semi-bird's eye view to act as my background for the image, upon which I painted a banner in the foreground. I then applied a Gaussian Blur in Photoshop to simulate depth of field, and as the leading puppet is pink colored, I tinted the background blue for better contrast.

I set the main light source according to the background image, to achieve consistent lighting and shadow effects, there had to be only one light in the work. As the puppets are in mid-air, I used Mental Ray to render the global lighting effect, and I supplemented this with a ‘sub-light’. Through this, the indoor effect of rich lighting was achieved (Fig.07).

I added a small reflection value to the material, besides the color map and bump map, which would not influence the overall effect, but did increase the feeling of illuminated faces.



Fig.07

Lastly, I rendered the models layer by layer, and then took them into Photoshop for post-production work, where I added some blur for the depth of field effect (the further from the camera, the blurrier the puppets) to distinguish the hierarchy of the characters. I also add some Motion Blur beyond the zoom lens to increase a feeling of movement, and I added a halo to the light source, increasing the contrast and therefore allowing the overall image to become more vivid (Fig.08).

### CONCLUSION

To attract the viewer's attention with such simple work, you need a novel design for the shape (and texture), shield color co-ordination, rich colors and consistent atmospheric rendering. If these requirements are met, an even simpler object could be present in an interesting and successful work – rich and full of meaning.



Fig.08

### ARTIST PORTFOLIO



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280

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281

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Here is what's in next months issue of 3dcreative

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by Jose Alves da Silva

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**Lighting: Indoor Scene**

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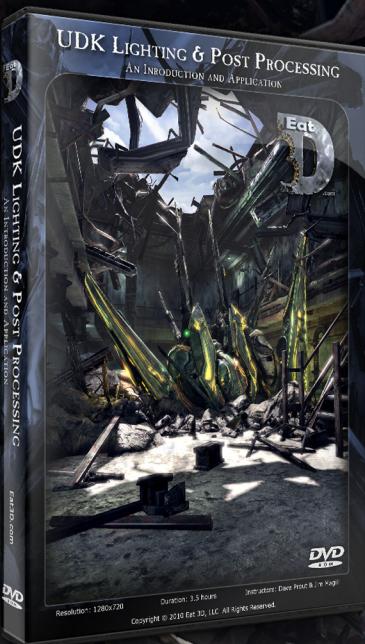
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# ENVIRONMENT LIGHTING

This five part series will focus on the topic of setting up a variety of lighting rigs that reflect natural lighting at different times of the day and manmade interior lighting. Each of the chapters will use the same base scene as a starting point, and will show a step by step guide to finding a lighting and rendering solution that best reflects the desired lighting situation.

The tutorials will explain the type of lights used and how to set up the parameters along with talking about the different methods of tackling the subject. The manipulation of textures may also be covered in order to turn a daylight scene into night scene for example, as well as a look at some useful post production techniques in Photoshop in order to enhance a final still.

## CHAPTER 1 | THIS ISSUE

Sunset / Sunrise

## CHAPTER 2 | NEXT ISSUE

Broad Daylight

## CHAPTER 3 | AUGUST ISSUE 060

Artificial Light - Bright over head light at night

## CHAPTER 4 | SEPTEMBER ISSUE 061

Artificial Light (Night-Time) - Mood Lighting (Low-Level - Romantic)

## CHAPTER 5 | OCTOBER ISSUE 062

TV-Lit (Night-Time) with Low-Level Lighting

## CHAPTER 1 - SUNSET/ SUNRISE

**Software Used:** 3ds Max + Mental Ray

Some distinct characteristics of a “Sunset” condition are the very long and soft shadows, with burnt yellow colors on directly lit areas.

Most objects affected by the sun rays at this time of the day appear to have a “rim” of burnt yellow color that propagates towards brighter hues of yellow.

Also, due to its low intensity, the overall environment is somewhat darker.

This phenomenon occurs mainly due to the earth’s position at that particular time of the day.

Mental ray is equipped with all the necessary tools to emulate the above mentioned effects.

Let’s start by opening the Max file.

Next, open the “render setup” dialog box (press F10).

In the “common” parameters rollout, pan down to the “assign renderer” rollout and click on the “production” toggle to load the “mental ray renderer”. Choose it and close the dialog box. (Fig.01)

Note that the system’s unit setup is already set to meters, and the rendering output size to 500x324 pixels. With the image and pixel aspect locked.

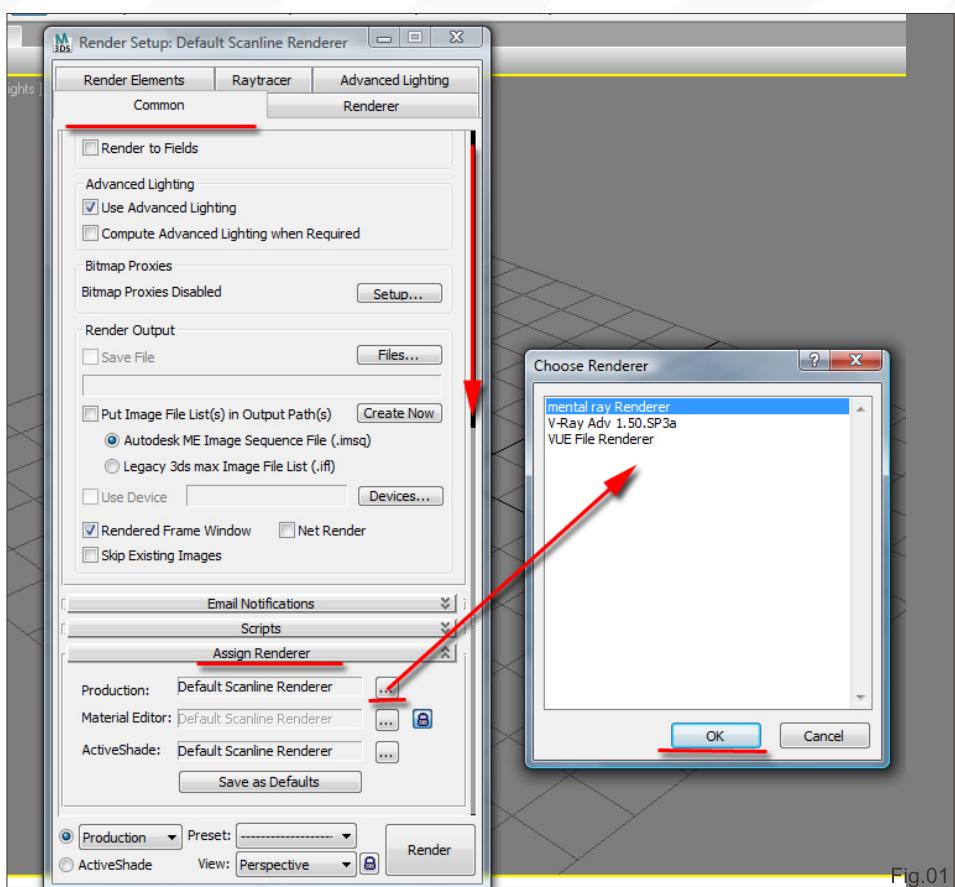


Fig.01

The camera position is also set and locked.

Next, we are going to create the daylight system, to set the shadow directions.

Make sure you have all four of the viewports available so you can have full control of the daylight system creation.

Create the daylight system by first clicking on the “create” main tool bar.

On the dropdown list, choose lights, followed by daylight system.

The daylight system creation dialog box should be prompted. Accept it, followed by left clicking and dragging the cursor to start the creation.

On releasing the mouse to complete the compass creation, the mental ray sky dialog should be prompted. Accept it to continue the creation.

Continue the creation by moving the cursor up or down to set the distance of the daylight object from the compass helper.

Once satisfied, simply left click to finish the creation. Click the “select and move” tool from the toolbar to complete and exit the creation. (Fig.02a and Fig.02b)

Note that, the “mr exposure” and “mr sky” dialogs will not appear if both of these toggles are not empty.

Now we have the daylight system created we can begin setting the shadow directions.

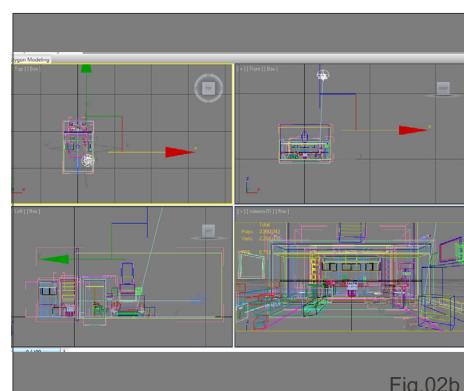
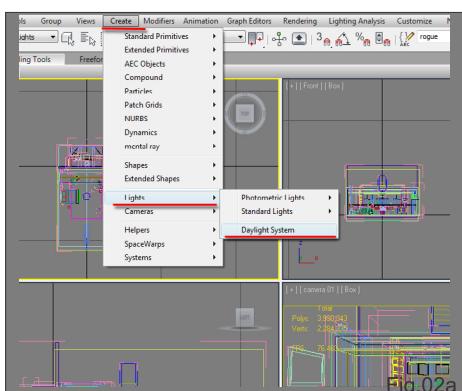


Fig.02b

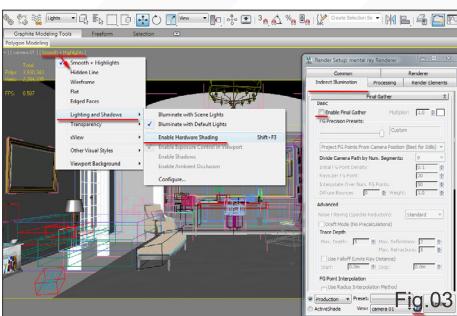
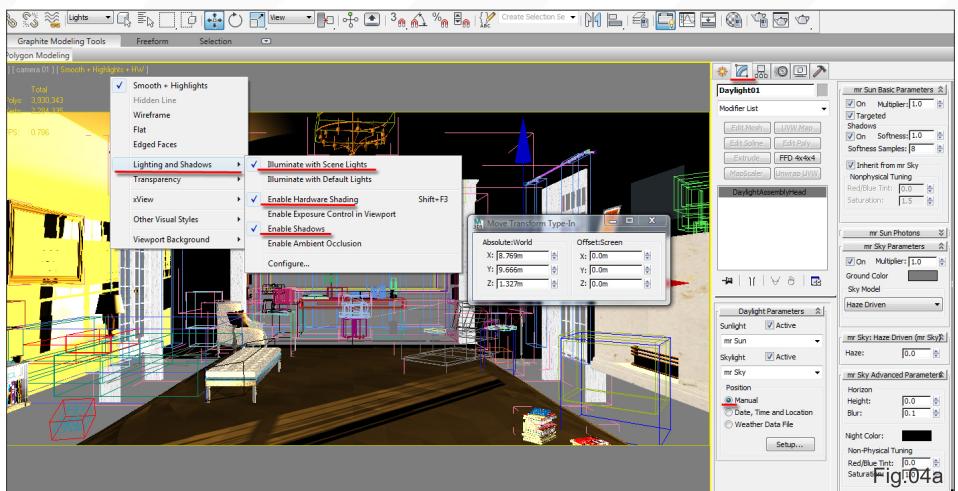


Fig.03

Prior to that, we are going to disable the final gather, for quick rendering results, and enable the hardware shadings function.



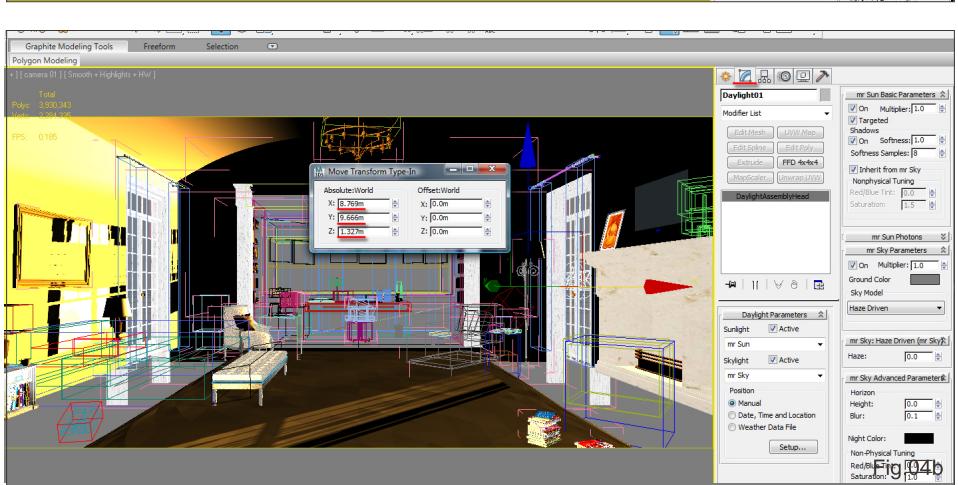
Convert the camera viewport from box visual style to smooth + highlights mode.

Click on its icon; on the dropdown list, choose the “lighting and shadows” function, followed by “enable hardware shading”. (Fig.03)

Next, select the daylight system object and open the “modify” command parameters.

By default its position is set to “date, time and location”. Change it to “manual”, and begin moving around the daylight system object.

The sun shadows should be considerably long and of “burnt yellow” colour, to resemble a sunset. (Fig.04a and Fig.04b)



If you are experiencing difficulties with your graphics card, simply disable the hardware shadings function, and click render (Shift + Q), to see the results.

The shadow position seems ok now. The next step is to use a basic material override color to further tweak the daylight system’s color and intensity.

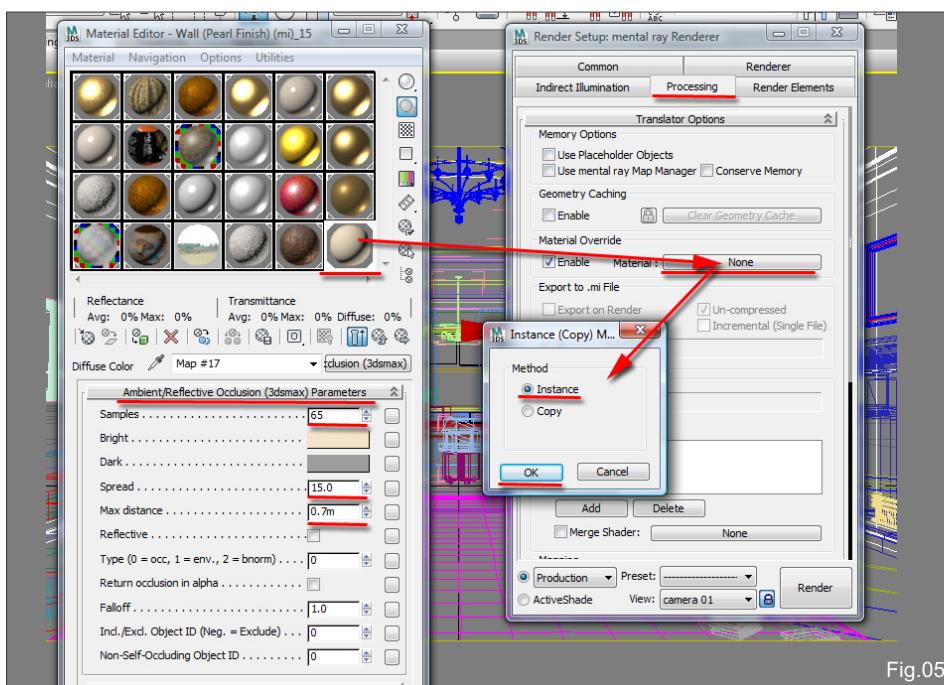


Fig.05

Enable the final gather and open the material editor (M).

Select the basic “wall (pearl finish)” material slot, from the “material editor”.

This shader has the “ambient/reflective occlusion (3dsmax)” applied to its diffuse toggle.

On the “render setup” dialog, open the “processing” rollout and enable the “material override” function.

Back on the “material editor”, drag and drop the “wall (pearl finish)” onto the “material override” toggle. Choose the “instance” copy method, on the “instance (copy) material” dialog. (Fig.5)

Click render (Shift + Q) to assess the changes. Accept to “continue” in the “missing map coordinates” dialog.

The render seems a bit dark still. In the “indirect illumination” rollout; Increase the Final Gather “diffuse bounces” to 1.0.

Open the “environment and effects” dialog (8), choose the “physically based lighting, indoor daylight” preset, from the “mr photographic exposure control” list.

Enable the “photographic exposure” function, and set the “shutter speed” to about 90.0.

Increase the “shadows” function to about 1.0. This will invigorate the shadows.

In the “image control” group, increase the “whitepoint” value to about 9500.0. Note that this value worked best to capture the white points in the scene.

In the Physical scale group, enable the “unitless” function, and set it to about 120000.0. Values between 90000.0 and 120000.0 work best.

While the daylight object is still selected, open the “modifier” command and increase the “mr sun basic parameter” “multiplier” to about 4.0.

The sun’s color at sunset is yellowish; to emulate this, disable the “inherit from mr sky” function first.

In the “nonphysical tuning” group, increase the “red/blue tint” value to 0.4(equal to a yellowish/

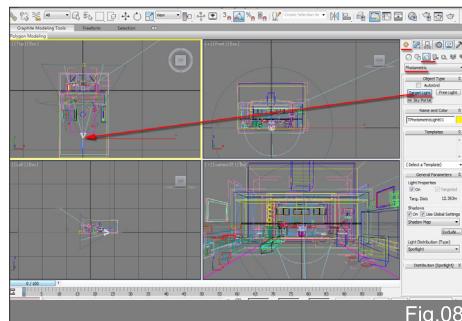


Fig.08

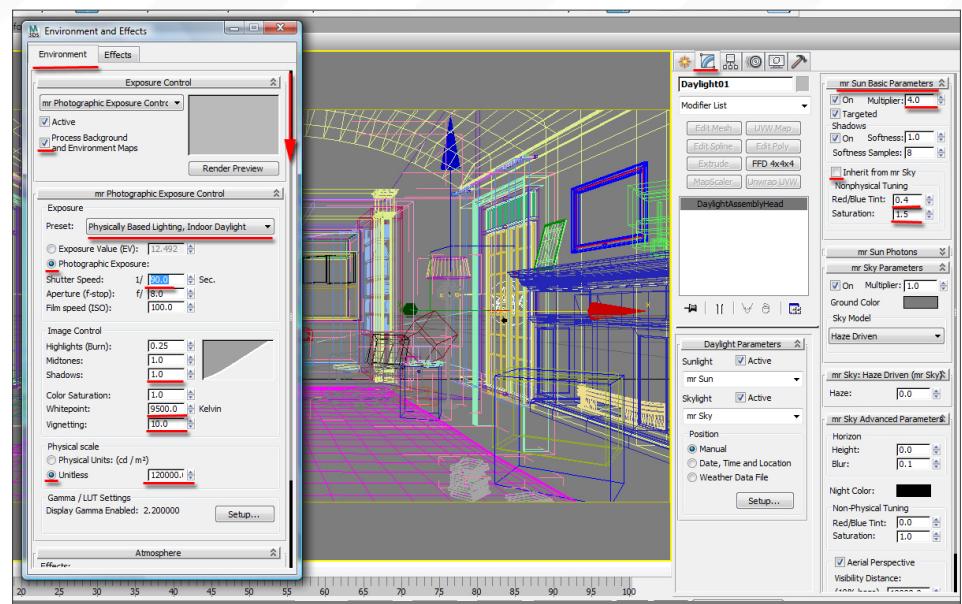


Fig.06

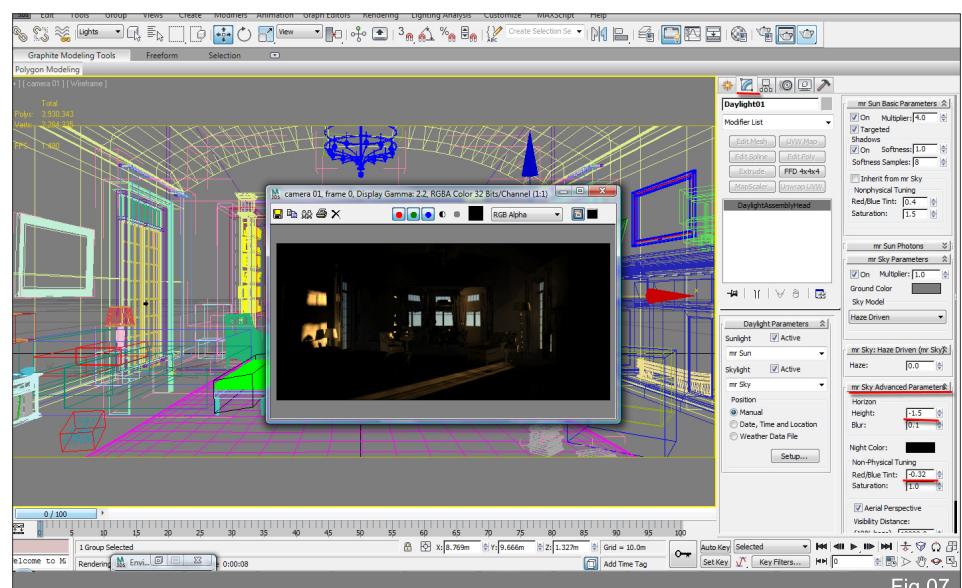


Fig.07

reddish colour). Also Increase its “saturation”. To about 1.5 then test render it. (Fig.06)

The next step is to decrease the sky horizon height and change its color to a stronger blue (next to the windows).

Pan down to the “mr sky advanced parameters” rollout; and bring down the horizon line by decreasing its “height” to -1.5.

To change the sky’s colour to a stronger blue, in the “non-physical tuning” group, decrease its “red/blue tint” value to -0.32. Then test render it again. (Fig.07)

The next stage is to add portal lights and a “fill” light in the foreground, to help improve further the overall illumination in the scene.

Select the top viewport. On the create command, open the “photometric light” set.

Click and drag the target light from the object type group to the front viewport, to create it. (Fig.08)

The principle is to create a nice diffused light to emulate light bounces around the designated area.

The first step is to change some of its default settings.

Now that the light direction is set, disable the "targeted" function, in the "general" parameters.

This will provide more flexibility when moving/placing lights in the scene.

Change the "shadows" type to "ray traced shadows", in the "shadows" group dropdown list.

Ray traced shadows work best with mental ray.

In the "light distribution" type group, change it from "spotlight" to "uniform spherical", to spread out the distribution of light.

In the "intensity" type, change it to dimming. This function will help control the light intensity.

Select and move up the light, near the camera's height (i.e. 1.186m).

Also, open the "mental ray message window", to monitor the rendering process.

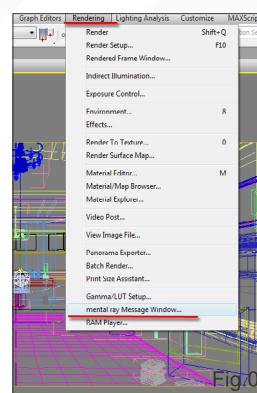


Fig.09

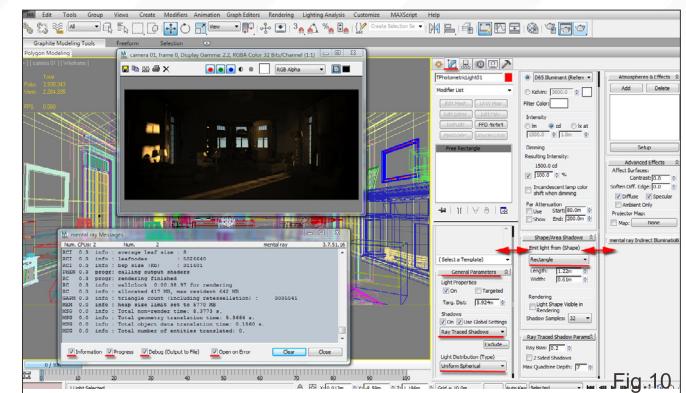


Fig.10

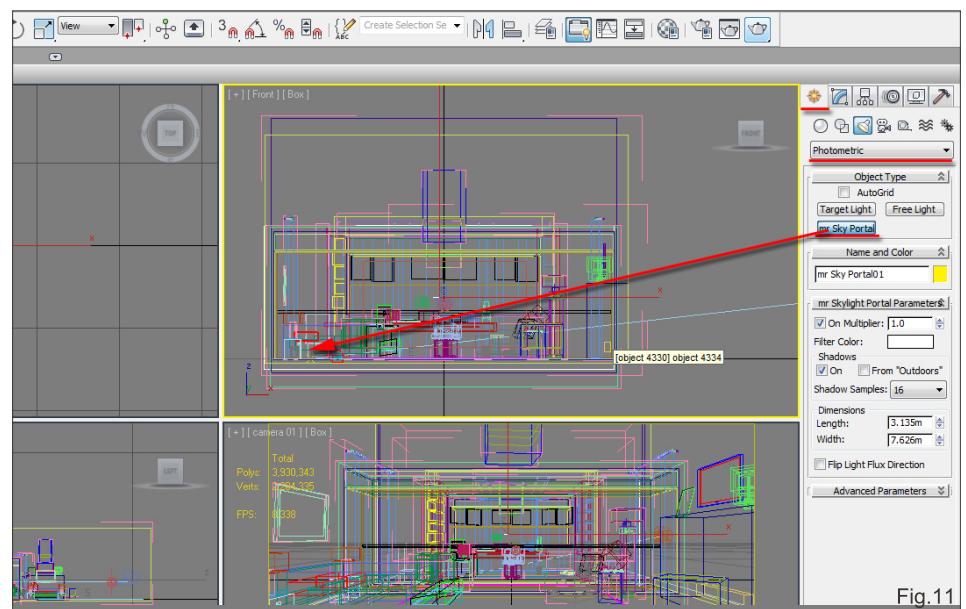


Fig.11

Finally, change the "emit light from" function from "point" to "rectangle" type. Rectangle type is highly recommended to control the softness of the shadows (i.e. higher values of length/width= softer shadows). Test render. (Fig.09 and Fig.10)

The scene is still a bit dark; increase its "dimming resulting intensity" values to about 1700.0. Then test render.

The scene now looks much brighter and balanced. Also, the burnt yellow rims around the sunlight's highlights are more apparent now. This phenomenon occurs mainly when the sunlight position is very low.

If desired, one can increase the photometric light's length/width rectangle values, to diffuse the shadows further.

The next phase is to add portal lights close to the windows, to emulate diffused shadows from the skylight.

Select the front viewport. On the create command, open the photometric light set.

Click and drag the "mr sky portal" from the object type group to the front viewport, to create it. (Fig.11)

The next step is to place this "mr sky portal" light close to one of the windows (move+ rotate) and change some of its core parameters.

Prior to start selecting and moving lights, it's worth enabling the lights "selection filter" from the main toolbar, to facilitate light selections.

Move/rotate and place the "mr sky portal" close to the left window.

Increase its width/length dimensions to fit the window's size.

Since this "mr sky portal" is being created mainly to emulate the diffused shadows, decrease its multiplier value to about 0.5.

Also, change its filter color to match the skylight.

Enable the "use existing skylight" function to closely match the skylight color.

Change the shadow samples to 32, to reduce the noise/speckles caused by its shadows in the scene (note that the value of 32 will increase the rendering time slightly however, since the sky portal multiplier value is low, it may balance things).

"Copy instance" the "mr sky portal" from the left window, to the right window.

Finally, just copy and move the third and last "mr sky portal". Place it behind the front window and match its dimensions. The renders should now look much better. (Fig.12a and Fig.12b)

With most lights added it is now the appropriate time to add a nice environment image to the background.

A bitmap will be used in conjunction with the current environment's "mr physical sky" shader.

This shader is very good in capturing the true essence of the daylight position.

For example, if the daylight position is low, the "mr physical sky" will add the burnt yellow rim light around the bitmap pixels...which is a very distinctive of the sunset lighting condition.

Open the "material editor" (M) and the "environment and effects" dialog(8).

Drag and drop the "mr physical sky" toggle onto a slot in the "material editor" dialog.

Accept the "instance copy" method. (Fig.13)  
Its parameters should load up.

Next, we are going to insert a bitmap in its "haze" toggle.

Disable the "inherit from mr sky" function. It's enabled by default, to link its parameters with "mr sky object" in the scene. Disabling it will break this connection.

To add a bitmap to the sky click on the "haze" toggle.

In the "material/map browser" dialog choose the "bitmap" option from the list, and "ok" to close it.

Pick the "outside Big\_brighter".jpeg bitmap. (Fig.14a and Fig.14b)

The bitmap and its parameters should load up. Its default parameters are set to "use real-world

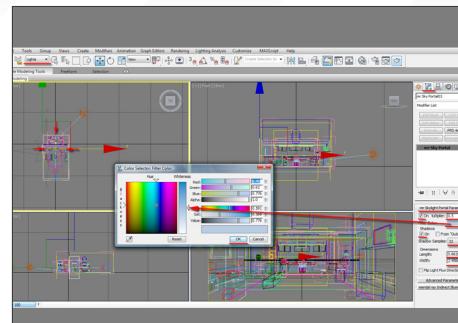


Fig.12a

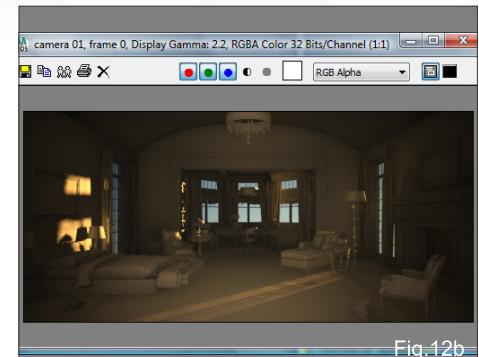


Fig.12b

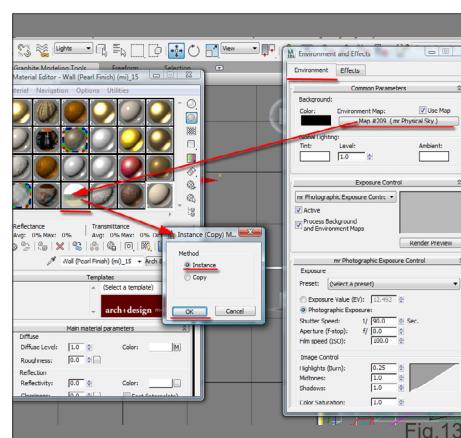


Fig.13

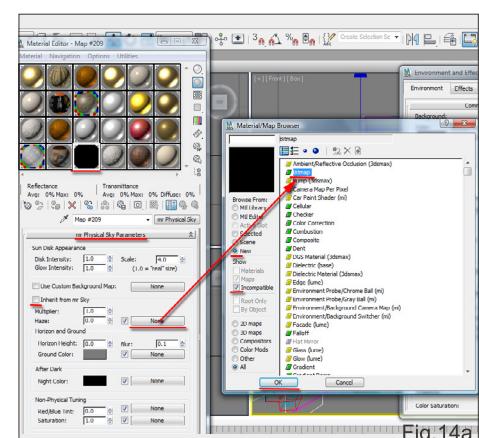


Fig.14a

scale". For better control of most parameters, one has to disable it, by first selecting the "texture" mapping type and disabling the "use real-world scale" function.

Next, change the mapping "environment" type. (Fig.15)

To quickly tile and centre the environment bitmap correctly behind the windows, we are going to first select and isolate parts of the window area in the scene.

Select and isolate the selected areas around the window area then test render to assess the bitmaps position in the environment.

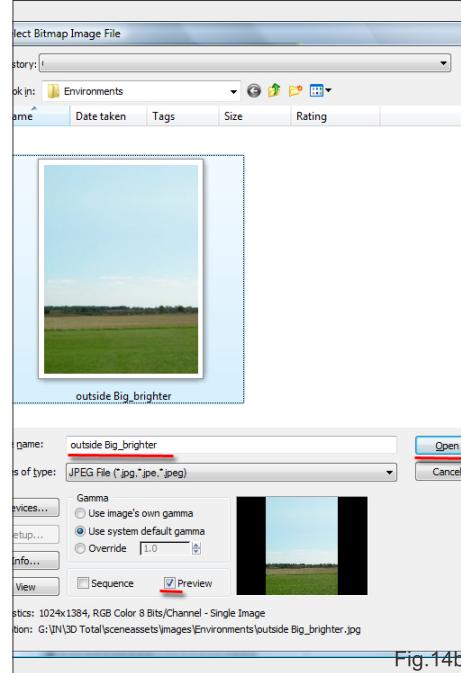


Fig.14b

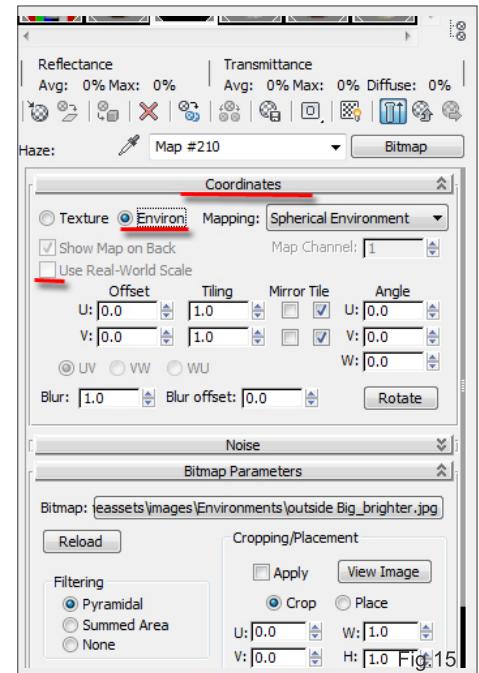


Fig.15

The bitmap doesn't seem to be visible yet; also, the horizon line is not matching with the mr sky object (i.e. -1.5).

In the material editor, pan down to the "output" rollout and increase the "RGB level" value to 10.0 then test render it again. One can also disable the FG process to speed up the rendering times, if desired. (Fig.16 and Fig.17)

To change the horizon line position; click on the "go to parent" button first, to go back to the main "mr sky" parameters.

In the "mr sky" parameters, increase the "multiplier" value to about 1.5, to brighten up further the environment map.

In the "horizon and ground" group, match the "horizon height" to mr sky object (i.e. -1.5). This function will subsequently reveal more areas of the bitmap.

Finally, to add a bit of a yellowish/reddish tint to the sky, go to the "non-physical tuning group" and increase the "red/blue tint" value to 0.3 then test render the results.

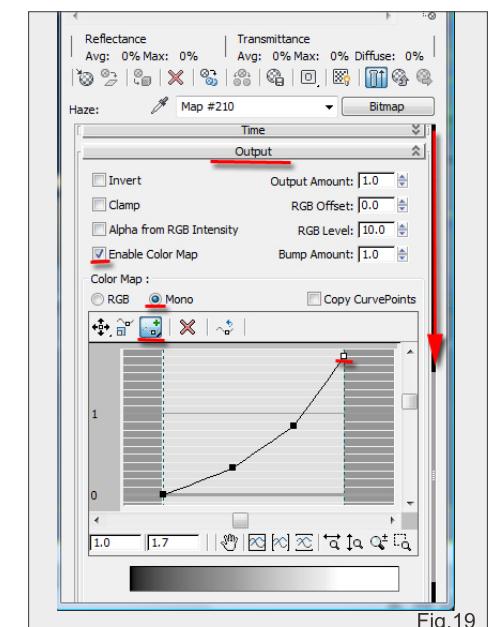
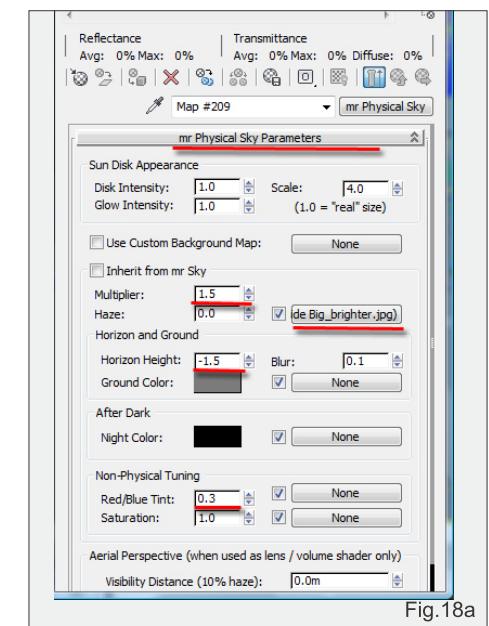
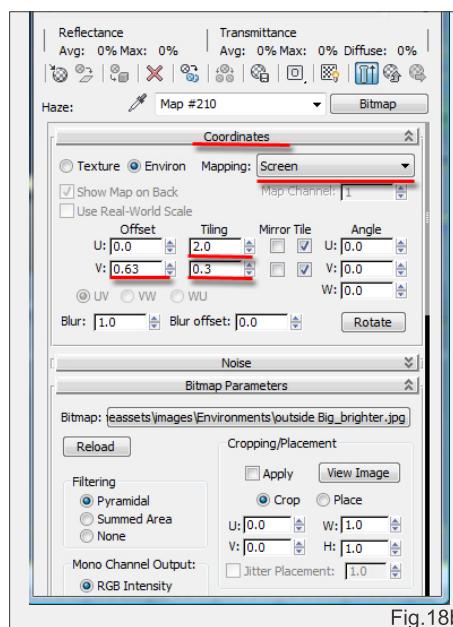
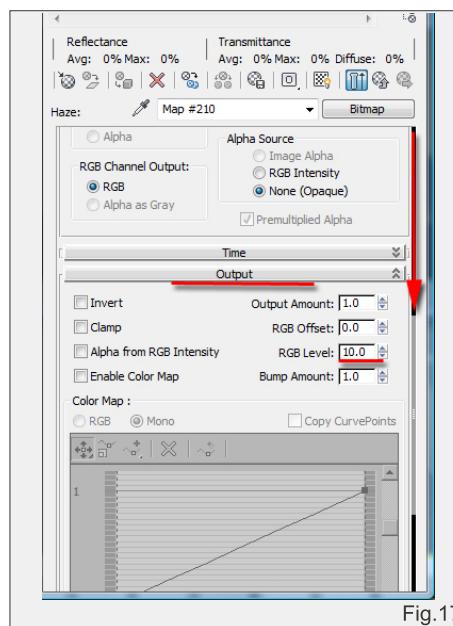
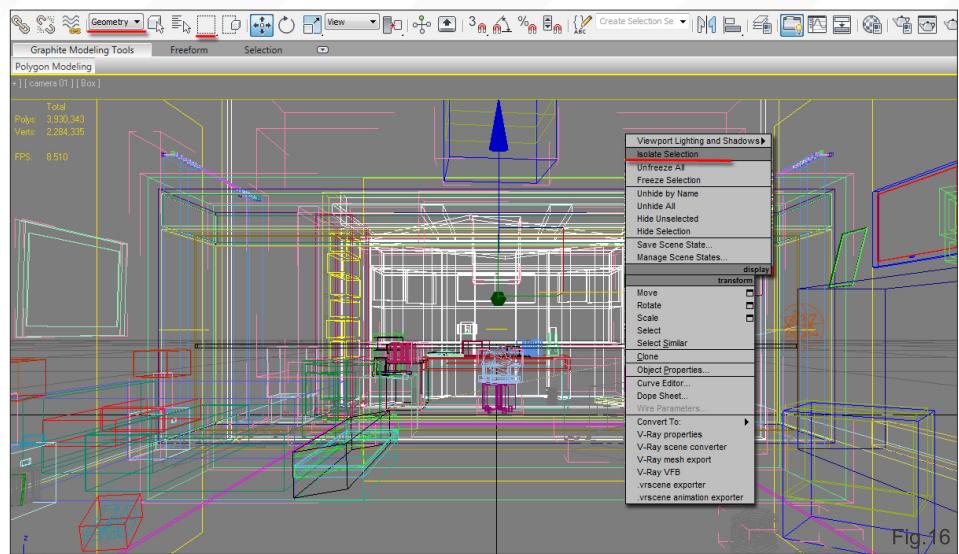
Back in the "haze" bitmap's "coordinates" rollout. Change the mapping from "spherical environment" to "screen" type.

Moreover, through quick test renderings increase the "V" "offset" value from 0 to 0.63; the "U" "tiling" to 2.0 and "V" to 0.3. The environment bitmap should be more visible and centralized now.

Next, we are going to fine-tune its appearance in the environment with the "output" curves. (Fig.18a and Fig.18b)

Pan down to the "output" rollout and check the "enable color map" function.

Click on the "add point" point button, to add curve points. Tweak and add more points whilst test rendering, to assess the changes. (Fig.19)



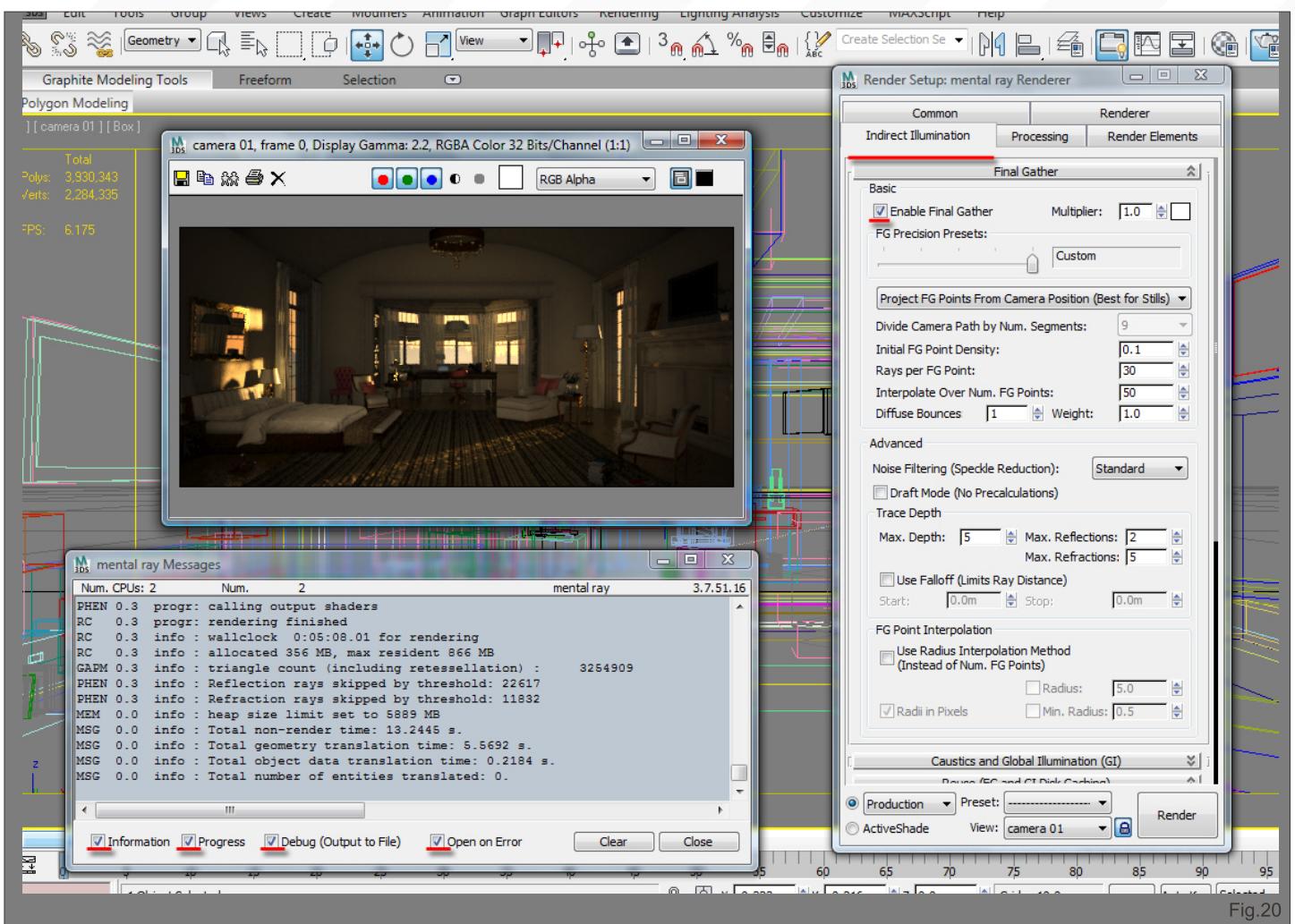


Fig.20

Note how the areas of the environment bitmap close to the sun disk have a rim of reddish/yellowish color around its pixels. To help accentuate this effect, go back to the main "mr physical sky" parameters. In the "sun disk appearance" group, increase the disk and glow intensity values to about 25.0.

Next, we are going to test render without the "material override", and set up for the final render.

Disable the "material override" function, in the render setup "processing" rollout.

Enable the FG process and test render. (Fig.20)

The render is looking reasonably ok now. The next stage is to save up the final gather files and send the final high resolution render.

With the FG saved, mental ray will bypass the FG process and concentrate mainly on rendering. This will subsequently reduce the rendering times dramatically. It is highly commended to use one computer only, when executing this task.

Once saved, one can then use multiple computers to reuse the pre-saved FG file to render the image.

Mental ray is very powerful and efficient in enabling users to save the FG file at a small output resolution (i.e. 320x240), and later reuse it for your final high resolution (i.e. 5000x3750), without artifacts.

Note that, the camera view, image and pixel aspect output size need to be locked beforehand.

Moreover, when network rendering, it's vital to have this pre-saved FG file in a location where other computers can "see" it and reuse it.

With the camera view, image and pixel aspect output size locked, we can now begin setting up the final FG parameters.

On "render setup" dialog, under "indirect illumination" rollout, increase the "initial FG point density" value to about 0.7.

This parameter is very useful to add depth to the results desired however; one may tweak these values as desired.

The value of 0.7 seemed sufficient for the results desired however; one may tweak these values as desired.

Note that, higher values will result in higher FG processing time. Default 0.1.

Increase the “rays per FG point” to 150. The value of 150 is often the minimum required to achieve a nice and smooth interior lighting however, one may tweak these values as desired.

This parameter helps to improve FG accuracy by shooting rays in the scene. Higher values equate to better results however the FG processing time will increase. Default 30.0.

The “interpolate over num. FG points” is very useful to correct most FG artifacts however; very high values will result in less depth in the scene.

Increase the value to 80. Note that, although very useful and effective, this parameter has little or no impact in the rendering time.

The value of 0 enables the mental ray “brute force” rendering ; which essentially renders the scene without the FG pre process (i.e. raw); this will subsequently increase the rendering times dramatically.

On the “processing” rollout, enable the “geometry caching” function. When enabled, this function caches the scenes geometry every time a render occurs.

For faster render translations; simply lock it to bypass this process. One should only

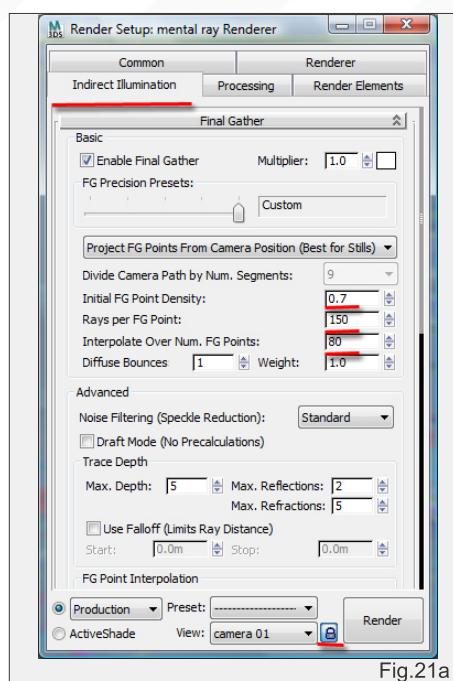


Fig.21a

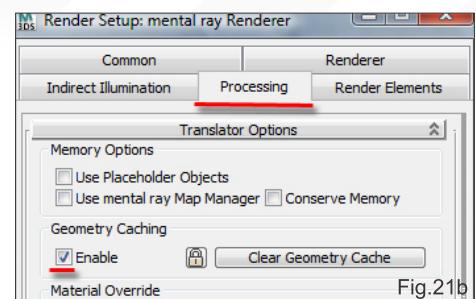


Fig.21b

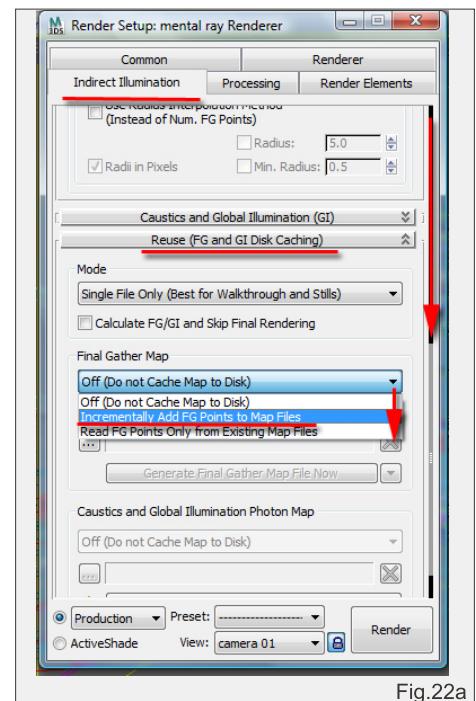


Fig.22a

lock it when all geometry changes had been addressed.

To delete any previously cached files, simply click the “clear geometry cached” button, and unlock it.

Default 50.0 (Fig.21a and Fig.21b)

With the above parameters set, it's now time to set mental ray to cache the FG maps.

Back on the “indirect illumination” rollout, pan down to the “reuse (FG and GI disk caching)” rollout.

Change the final gather map type to “incrementally add FG points to map files”. This function will calculate and save all the final gather points.

Click on the file toggle to set the name and destination of the saved FG file. Save it in the network preferably...as mentioned earlier. The adjacent button(X) enables the user to delete any existing file in the written destination.

Since we know the overall result of the render, it's wise to enable the “calculate FG/GI and skip final rendering” function, if desired. This function forces mental ray to compute the Fg process only, skipping the rendering. Some users prefer to see the final result.

Finally, click the “generate final gather map file now”, to render. Or alternatively press shift + Q. (Fig.22a and Fig.22b)

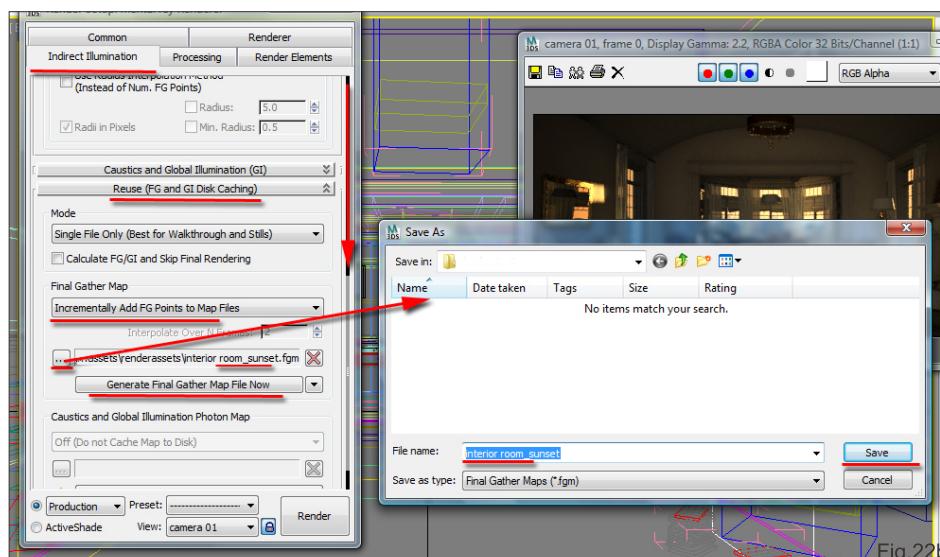


Fig.22b

Once the rendering process is finished; change the final gather map type from “incrementally add FG points to map files” to “read FG points only on existing map files”. This will freeze and reuse the FG map.

Also, lock/freeze the cached geometry from “geometry caching” function. (Fig.23)

Mental ray is quite powerful in producing glare; camera depth of field and chromatic aberration effects straight from the renderer however, in this exercise we will use 3Ds Max’s rendered elements to facilitate adding some these effects in Photoshop.

The first element to setup is the Z depth. This element will help to add the camera depth of field in Photoshop, if required.

It is prudent to setup its parameters prior to sending the final render:

In the “render elements” rollout, click the “add” button to open the render elements dialog. Choose the “Z depth” element from the list (Fig.24).

The “enable” function needs to be checked. By default, its file destination path is the same as the render output file.

The min and max Z values are set from 100 to 300 by default. Tweak and test render with its settings to see what suits best.

It is worth mentioning that one can increase the original Z Depth contrast in Photoshop (i.e. with curves/levels) to expand darker/brighter areas. (Fig.25)

Material and object’s Ids elements are equally crucial when sending out the final renders; especially when one is required to address changes quickly. (Fig.26)

One should start tagging the objects and materials from the start of the project; as objects and materials can quickly grow to unmanageable numbers.

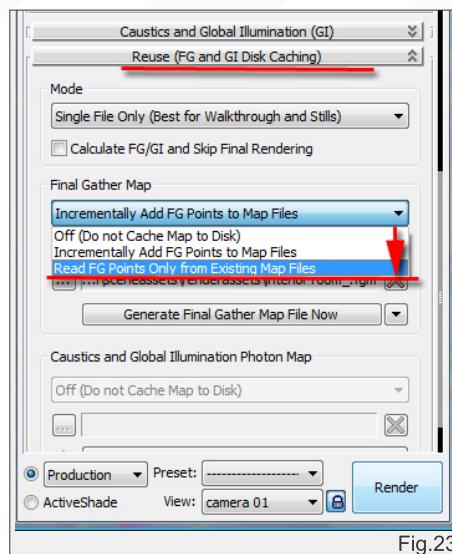


Fig.23

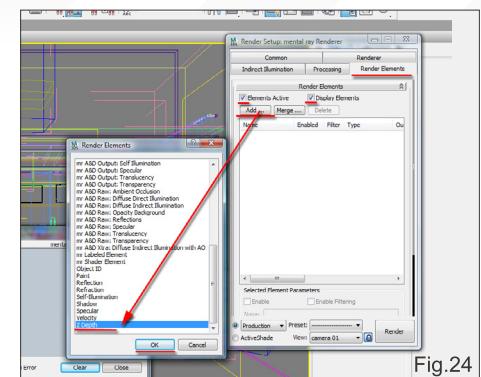


Fig.24

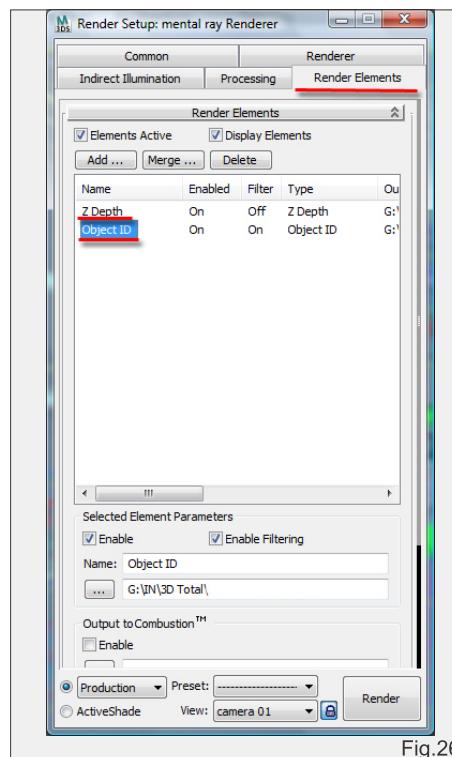


Fig.26

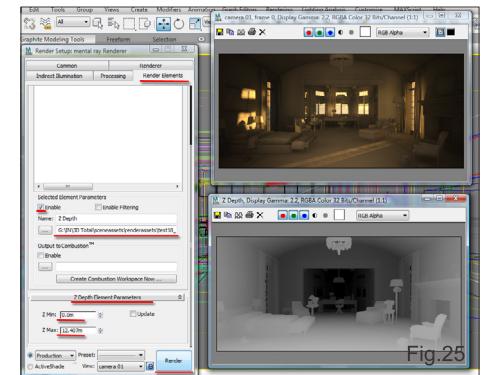


Fig.25

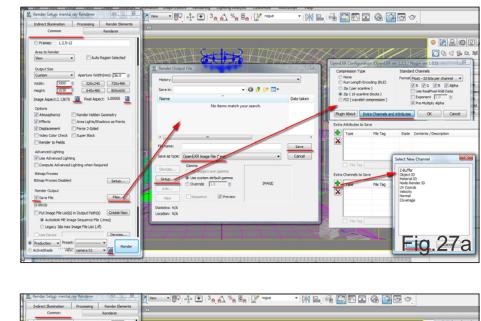


Fig.27a

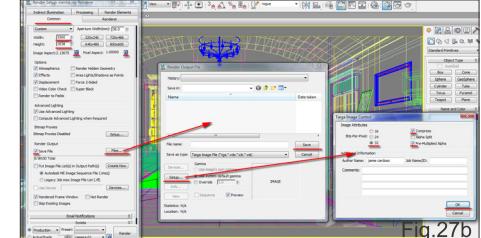


Fig.27b

Once satisfied with most parameters, one can begin to prepare the scene for final rendering.

On “common” rollout set the final output size to 3500x1638 pixels. Note that there was no need to render higher resolution, as the render is looking very sharp and without noise.

On “render output” group, click on the “files” toggle to choose the file location and format. This new location will subsequently alter the original rendered elements location.

I personally use “Targa Image file” formats, since all the extra rendered elements are being saved however, a growing number of users are choosing ILM’s “OpenEXR image file” format.

Note that, when opening these files in Photoshop, one will be required to turn its default 32bits/channel mode to 16bits or lower in order to utilize some of the Photoshop’s filters and layer adjustments. (Fig.27a and Fig.27b)

On the “renderer” rollout, increase the soft shadows precision (multiplier) to 4.0. This

function will correct any soft shadows artifacts caused by the sun position; at cost of some additional rendering time. Note that this parameter works globally. Otherwise the sunlight's shadow samples would have been more adequate.

Increase the "glossy reflections precision (multiplier)" value to 4.5. This function will correct any glossy artifacts, at the cost of some additional rendering time.

Also, change the "sampling quality" to 1/16 samples per pixel and the filter type to "Mitchell", to increase the rendering quality.

It is recommended not go higher (i.e. 1/64), especially when the final output size is already big.

With everything set, one can finally click render to see the final high resolution render, from your machine. (Fig.28a and Fig.28b)

Alternatively, "distributed bucket rendering (i.e. DBR)" or "net render" rendering techniques could be used for those fortunate enough to have additional computers.

#### Distributed Bucket Rendering:

Ensure to use one method or the other, not both at the same time.

Also, one should not use this rendering method for animations. It works best with still images. All files should be (i.e. FG; bitmaps; file output path etc) in a shared drive (not local drives i.e. C drive, etc).

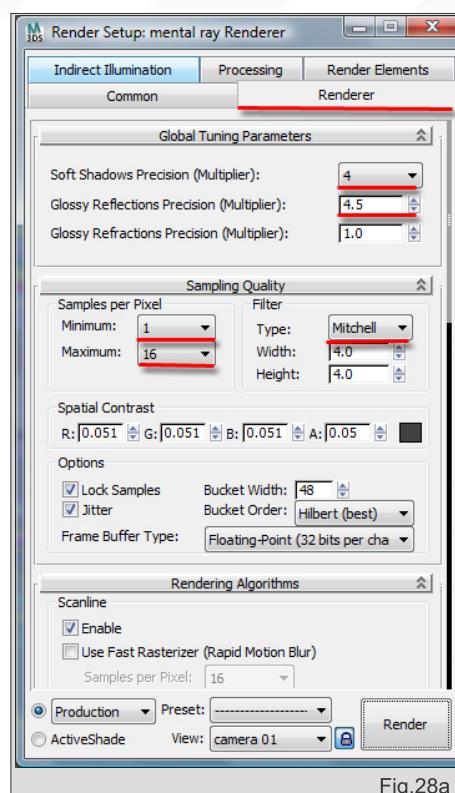
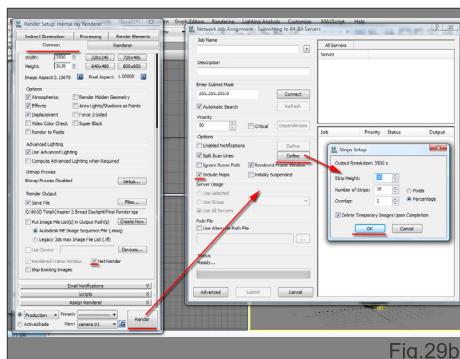


Fig.28a

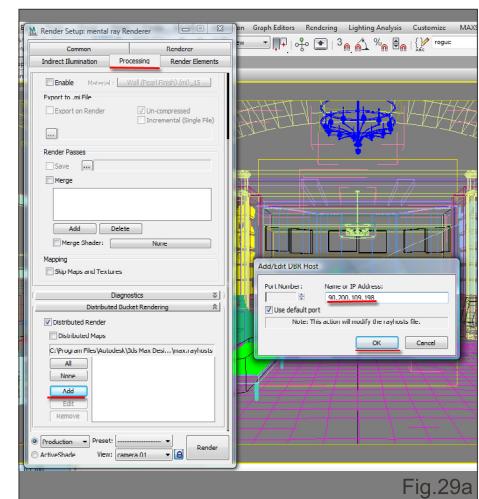
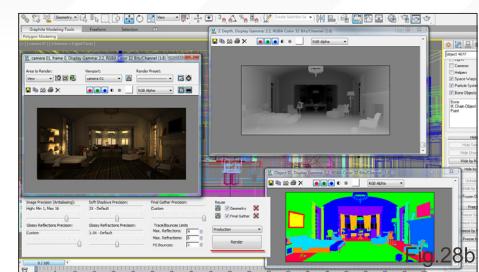


Fig.29a

Open the "render set up", on "processing" rollout, under "distributed bucket rendering" parameters, check the "distributed render" function.

Click the "add" toggle to add the IP address. The "add/edit DBR" host" dialog box should appear.

Type the IP address number followed by ok to close the dialog box.

Keep adding as many as available and allowed.

To edit, simply select one machine at time and click edit.

To monitor the rendering process, simply open the "mental ray message window".

Check all its options (i.e. information, progress, debug (output to file), open on error etc). (Fig.29a)

#### Net Render:

Ensure that all your files (FG; bitmaps; file output path etc) are in a shared drive (not local drives i.e. C etc).

Also, the "net render" toggle needs to be checked, and click render. The "network Job assignment" dialog box should be prompted.

Ensure that the "include maps" function is enabled; in case there are any bitmaps or mapping coordinates missing.

Click "connect", to see all the available machines in the server. Select the desired machines from the server field name.

On the "server usage" group, choose "use selected" to enable only the selected machines to be used.

On the "options" group, choose the "split scan lines" option, followed by clicking on the "define" toggle. The "strips setup" dialog box should be prompted: set it to pixels; the overlap value to 2; the number of strips to 10 and strip height to 48; and click o.k. to close the dialog box. Click submit to render. (Fig.29b)

Disable the "use map" function and its color swatch to white. This is to make the background color white.

Keep the image “sampling quality” as before 1/16 samples per pixel and “Mitchell” filter.

Finally, turn off the exposure controls and click render.

#### Ambient Occlusion (AO):

It is common practise to save out the AO as a separate pass, for compositing. This methodology enables users to have full control of its appearance without having to re-render.

Open the “material editor” and choose a completely new material slot by dragging and dropping from one editor slot to another.

Rename it, and load a new mental shader from the “material/map browser” list. See (Fig.30a and Fig.30b)

With the mental ray shader loaded, click on its “surface” toggle to load up the “ambient/reflective occlusion” shader, from the “material/map browser” list.

Its parameters should load up; change “samples” value to 60; the “spread” value to 7.0 and “max distance” to 0.3.

Note that these values worked best for the effect intended however; one may try different values, if desired. (Fig.31a and Fig.31b)

Next, open the “render setup” dialog and select the “processing” rollout.

Enable the “material override” again, and drag and drop the AO material slot to the “material override” toggle. Choose “instance” method. (Fig.32).

Disable the FG and open the “environment and effects” dialog.

Disable the “use map” function and its colour swatch to white. This is to make the background color white.

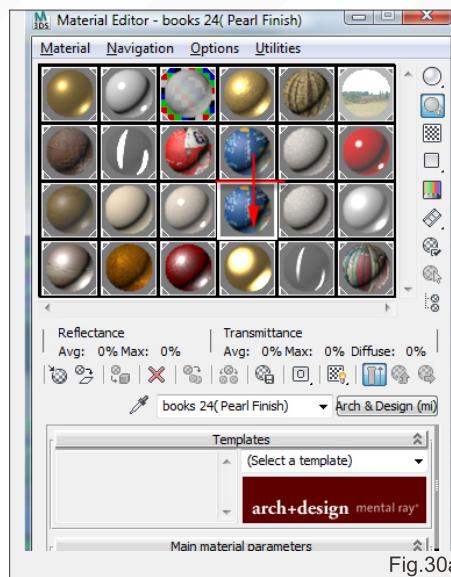


Fig.30a

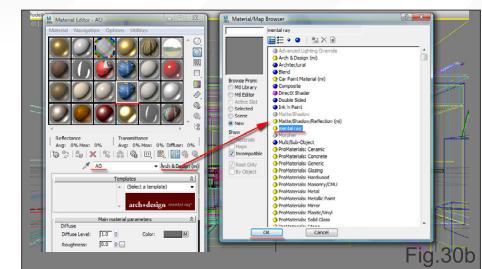


Fig.30b

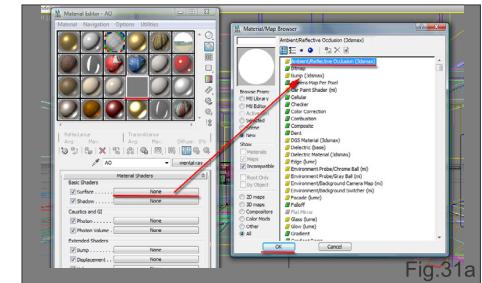


Fig.31a

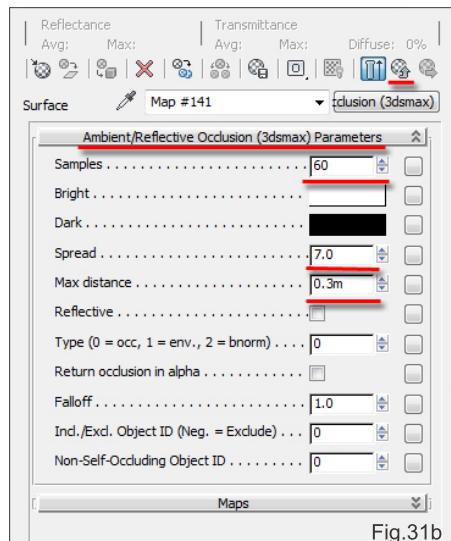


Fig.31b

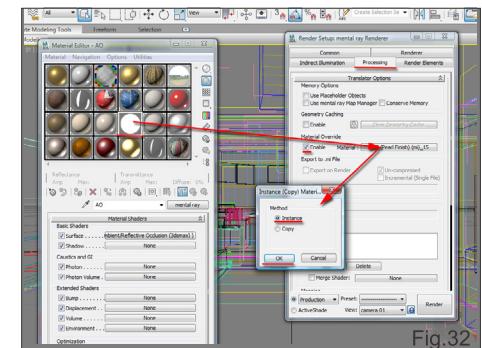


Fig.32

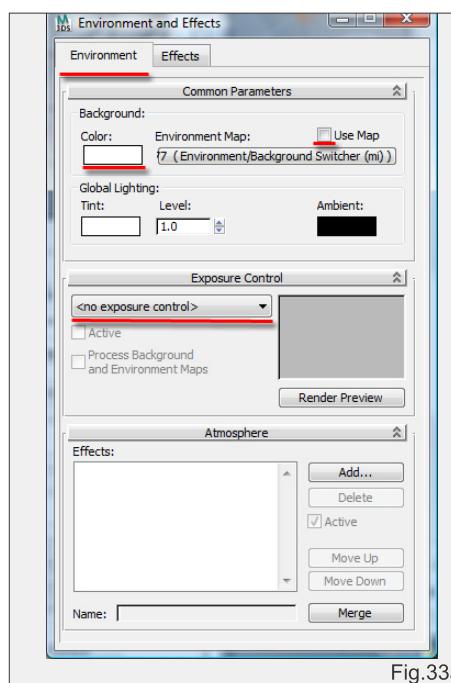


Fig.33a

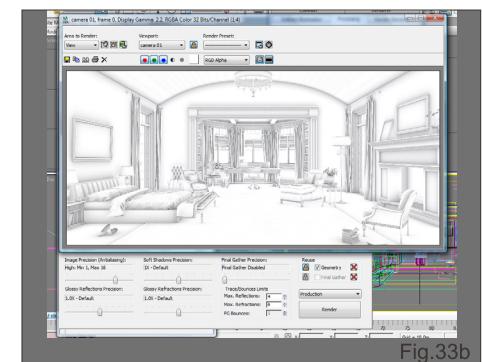


Fig.33b

Keep the image “sampling quality” as before 1/16 samples per pixel ; “Mitchell” filter and the “soft shadows precision (multiplier)” to 1.0 .

Finally, turn off the exposure controls and click render. (Fig.33a and Fig.33b)

## PHOTOSHOP

Photoshop is very powerful and useful when incorporating quick changes and/or effects that would otherwise be time consuming to address in Max alone. Having said that, it is also important to have relatively decent renders from

Max. This work process will later prove very fruitful for one's final piece.

In this final part of the tutorial, we will bring in the main rendered image, along with the pre rendered AO element.

Although we had rendered numerous elements, we will be using the AO pass only, for the purpose of this exercise. Open the main render along with the above mentioned element.

Select the rendered image document; on its "layer" rollout duplicate it, by right clicking and selecting the "duplicate layer" option from the popup list.

Name it "render"

Also, change its original white color to red, by right clicking on the layer and selecting the "layer properties" option from the list. This will help differentiate layers. (Fig.34)

The next step is to emulate the "bloom" camera effect. Note that this effect could have been easily achieved with mental ray however, we had decided to do it in Photoshop, as it gives us the flexibility to quickly edit/choose the areas affected by this effect.

Open the "channels" dialog and press Ctrl + left click on the "alpha" layer, to select its pixels.

Note that, the alpha channel came integrated with the TGA rendered file.

Now that the alpha channels are selected, Inverse the selection (Shift + Ctrl + I), to select the desired areas.

Use the "polygonal lasso tool" (L) to subtract (Alt) and/or add (Shift) selection areas for the bloom effect. These areas should be white, preferably.

While the selection is still on, save it by clicking the "select" rollout from the main toolbar and

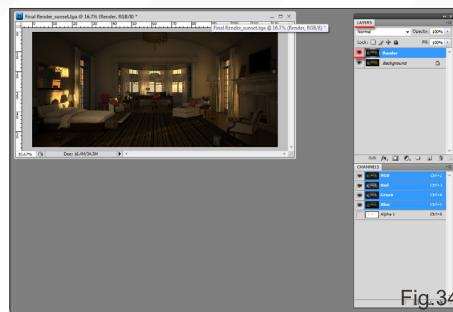


Fig.34

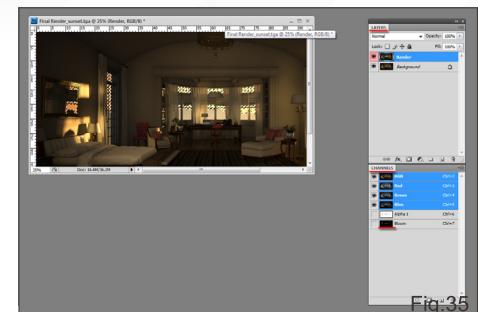


Fig.35

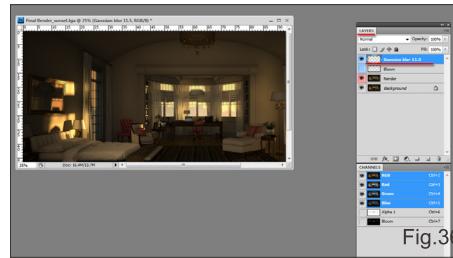


Fig.36

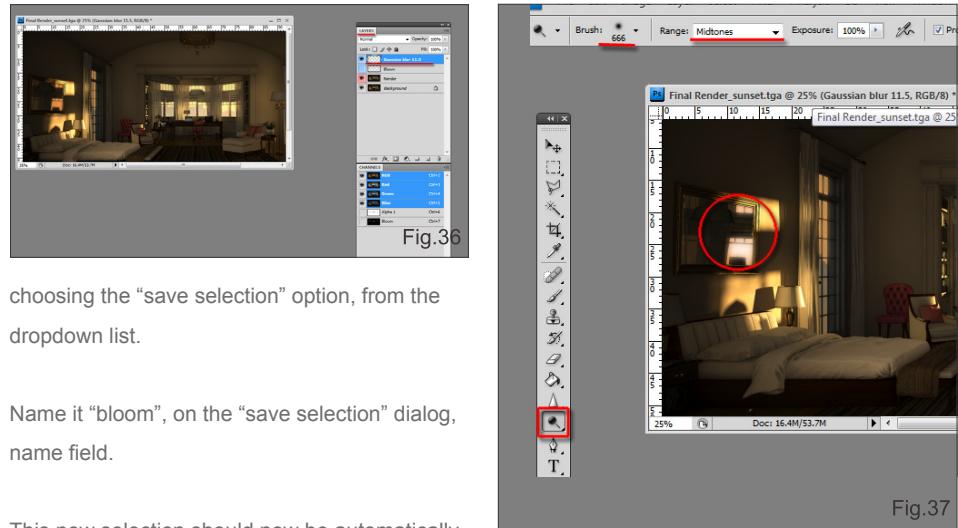


Fig.37

choosing the "save selection" option, from the dropdown list.

Name it "bloom", on the "save selection" dialog, name field.

This new selection should now be automatically added onto the channels list. (Fig.35)

Next, while the selection is still on, select the "render" layer, followed by copying (Ctrl + C) and pasting (Ctrl + V) to create a new layer from the selection.

Change its layer properties colour to blue, and name the new layer "bloom".

Next we are going to apply a nice "Gaussian blur" filter to emulate the bloom effect.

Duplicate the layer to keep the original copy.

It is prudent and common practice to retain the original layers prior to editing it.

Click on the "filters" rollout from the main toolbar and choose the "Gaussian blur" filter from the dropdown list.

The value of 11.1 seemed to have worked best however; you may want to try different values, if desired.

For future reference, it is always commendable to rename the layer according to the filter applied, plus its values (i.e." Gaussian blur 11.5"). This will make it easier to remember the original filter applied. (Fig.36)

The reflection of the environment on the mirror is not as intense as the front areas of the window. This is probably accurate however; brighter reflections would look better for the sake of the composition.

Select the dodge tool (O) and the "bloom" layer.

Set the range to "midtones", click and brush around the relevant areas, until satisfied with the brightness. (Fig.37)

Next, we are going to use the "curves" adjustment layer to brighten up the scene a bit.

Add the "curves" adjustment layer by clicking on the "create new fill or adjustment layer" button.

Choose the "curves" from the popup list.

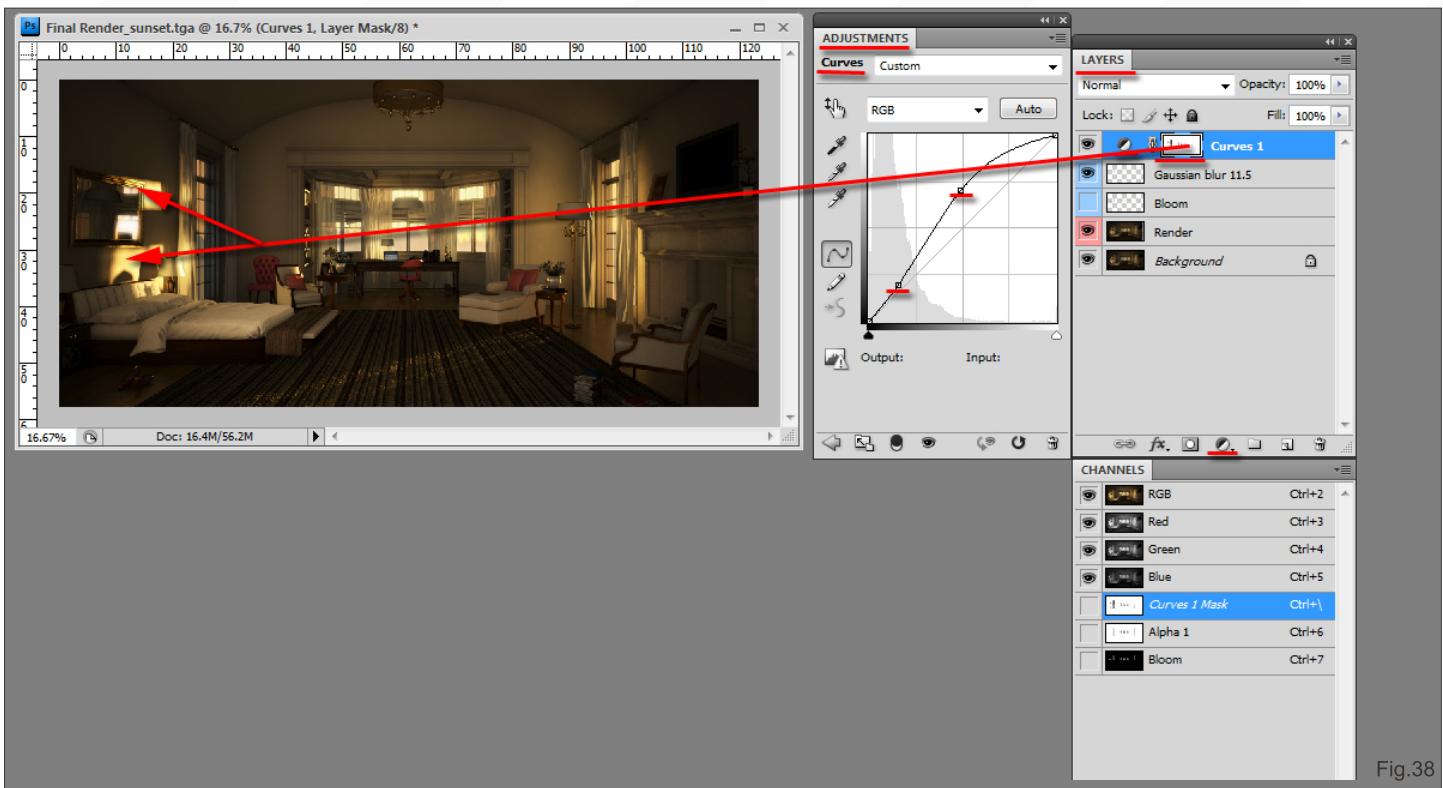


Fig.38

Add and move points so the brighter areas of the image are increased considerable; and the darker areas slightly.

Use the “brush” (B) tool, to mask out overexposed areas such as the directly lit and overblown areas by the bed side.

The mask layer works best with black and white colors(X). Black= to omit pixels(X); White= to bring pixels to prominence(X). (Fig.38)

Next, we are going to colour grade the image with the “Color balance” and “hue and saturation” adjustment layers.

To capture the true essence of this particular time of the day, we will first add a mix of red and green tones to the image.

Add the “color balance” adjustment layer. Increase the red midtone to about +29; and the green to about +12. You may change these values, if desired. (Fig.39)

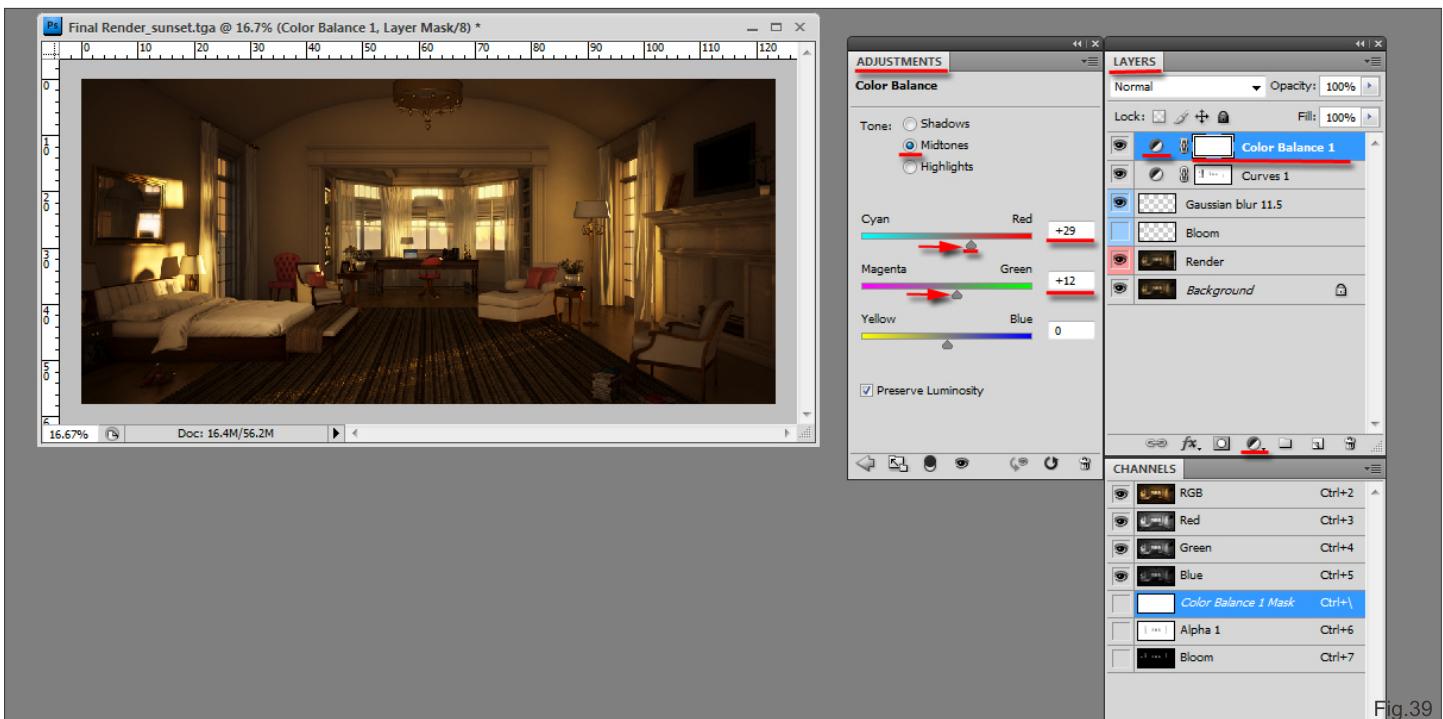


Fig.39

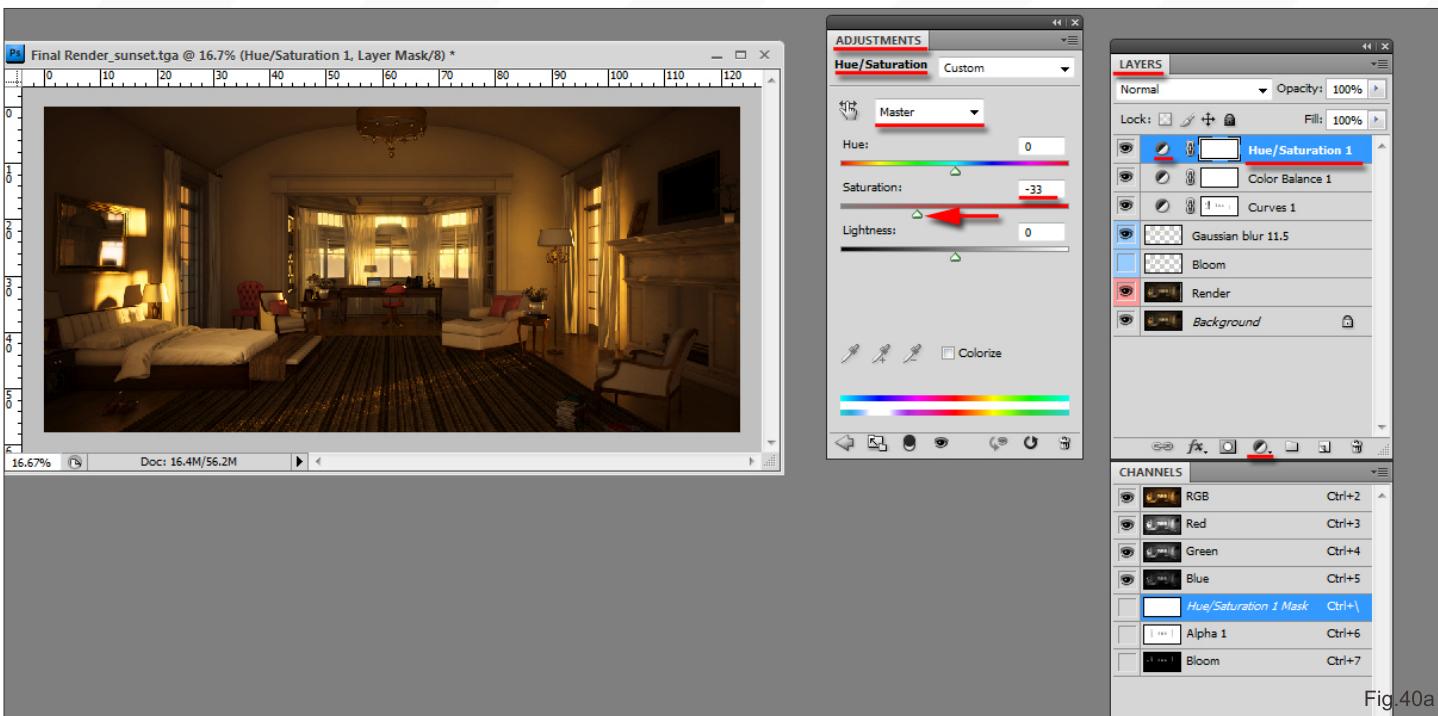


Fig.40a

The “hue and saturation” adjustment layer will help balance the overall tone of the image.

Add the “hue and saturation” adjustment layer. Decrease the overall colour (i.e. master) saturation to about -33.

The next stage is to tweak with specific colors. The first color to concentrate on is red.

Choose the red colour from the palette list.

Increase its “saturation” to about +35. This parameter will only affect the red colors/tones of the image.

Increase the yellows “saturation” to about +49, to accentuate the yellow tones/colors.

Finally, increase the blues to about +56 and its brightness to +100.

Note that these values can be changed, if desired. (Fig.40a, Fig.40b, Fig.40c and Fig.40d)

The “sunset” “feel” of the overall image is now more prominent because it had been color graded.

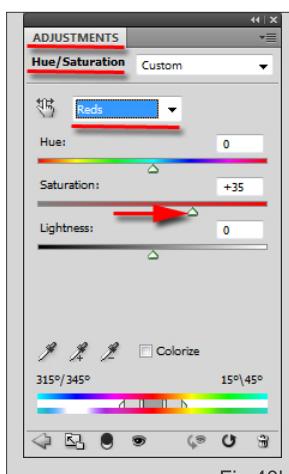


Fig.40b

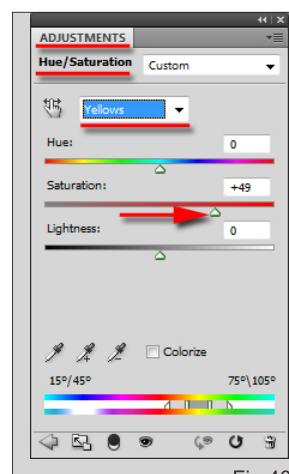


Fig.40c

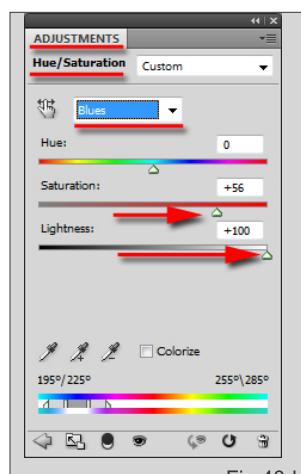


Fig.40d

Now is the time to add the AO pass for additional depth.

Select the AO document and duplicate it. In the “duplicate layer” dialog; under the “destination” group, choose the relevant document (i.e. “Final render.sunset.tga”) destination, and name the layer as AO.

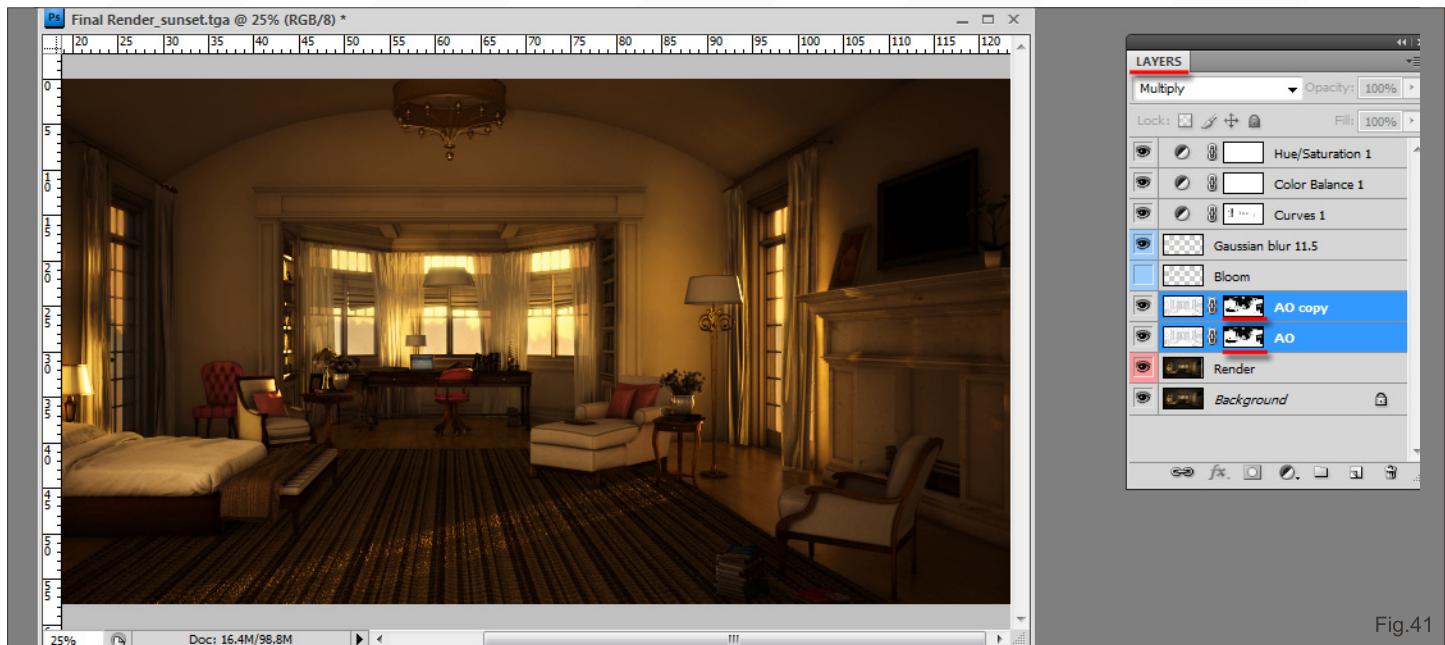
This will paste this duplicated layer in the chosen document, with the appropriate name.

In the “Final render.sunset.tga” document, move down the AO layer to be placed on top of the “render” layer.

The next step is to blend the AO layer and edit its appearance.

Set the AO layer blending mode to “multiply” type. Create a mask for the AO layer, by clicking on the “add vector mask” button. This will help edit this layer with the brush tool (B).

While the AO layer mask is selected, enable the brush tool (B) and begin brushing around the areas of the image that you desire to omit or have less prominence. The mask layer works best with black and white colors(X). Black= to omit pixels(X); White= to bring pixels to prominence(X).


**Fig.41**

Moreover, the opacity function on the main toolbar helps to set the visibility of the brush strokes.

Finally, one can duplicate the AO layer to accentuate its appearance. (Fig.41)

Sun glare is often associated with the sunsets. When used appropriately, it can add a lot to an image.

Open the PSD file under the name of "Sun Glare.psd" and drop it at a lower/mid level of the window, on right hand side of the image.

The window on the right hand side was chosen, because it matches with the original position of the sunlight's position in the Max scene.

Ensure that, it's on top of all layers of the document.

Use the "linear dodge (add)" blending mode to help blend it; and edit "transform" it to occupy a small portion of the window.

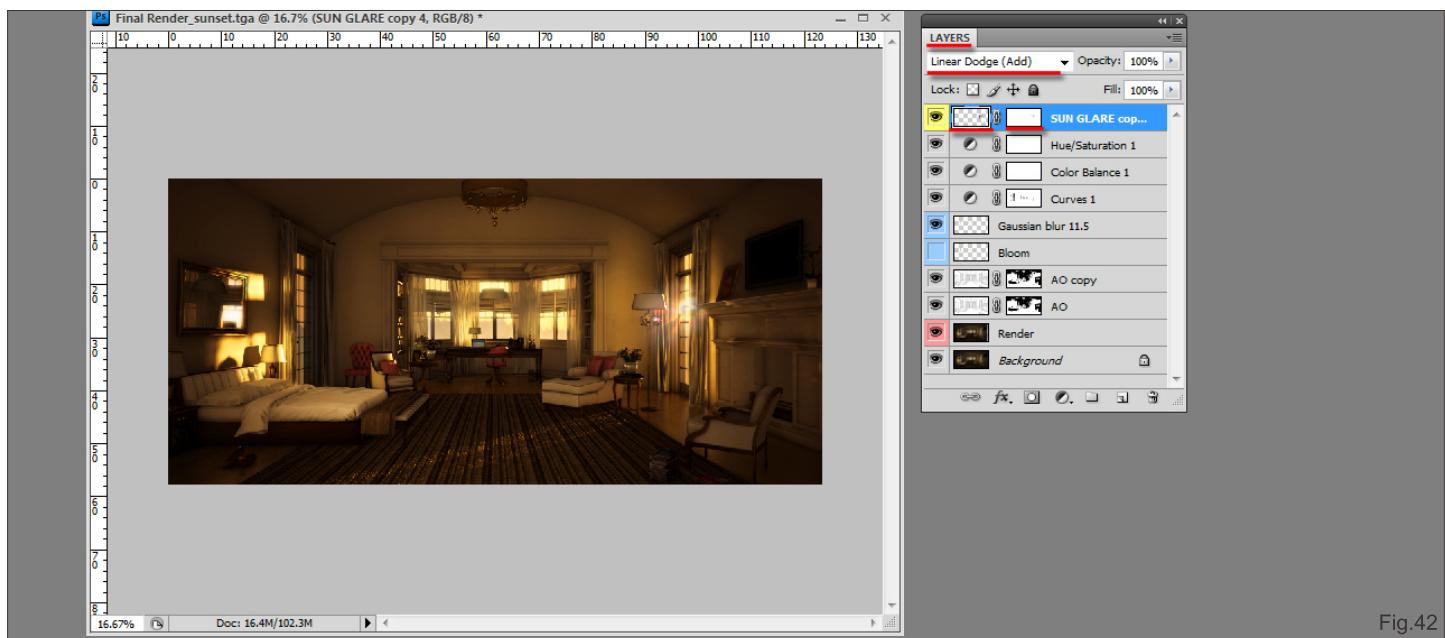
The final result should be a nice sun glare bursting through the window.

Once satisfied with the image, save it as TIFF, if desired.

Tiff file formats are highly recommended by the reprographics, as these file types retain the original quality of the render. JPEGs should only be used for email and web purposes. (Fig.42)



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**Fig.42**

# JAMIE CARDOSO

For more from this artist visit:

<http://jamiecardoso-mentalray.blogspot.com/>

Or contact them:

jamiecardo@hotmail.com







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# ENVIRONMENT LIGHTING

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## CHAPTER 1 | THIS ISSUE

Sunset / Sunrise

## CHAPTER 2 | NEXT ISSUE

Broad Daylight

## CHAPTER 3 | AUGUST ISSUE 060

Artificial Light - Bright over head light at night

## CHAPTER 4 | SEPTEMBER ISSUE 061

Artificial Light (Night-Time) - Mood Lighting (Low-Level - Romantic)

## CHAPTER 5 | OCTOBER ISSUE 062

TV-Lit (Night-Time) with Low-Level Lighting

## CHAPTER 1 - SUNSET/ SUNRISE

Software Used: 3ds Max + V-Ray

Welcome to this tutorial where I will try to describe the way I set the lightning for this scene. In this series there will be six different types of lightning, from sunset through to broad daylight then on to night time. In the first one our goal will be to achieve a sunset lightning setup. Since later on the other tutorials will be mostly on artificial lightning I choose not to include any artificial lightning sources here. Therefore the scene will be lit by the sun only, as it's supposed to be at a part of the day when it isn't that late and the sun still provides enough light for the interior.

First we need to check our scene. We can see that there are many windows around the room facing three different directions. Also they differ in sizes. (Fig.01) Straight away I can think of 3 ways to solve the lightning for this scene.

The first and easiest way is to simply use a Vray sun as our only light source with a Vray sky in the background slot. This sure is the fastest way to set up and to render. Therefore I use this in most cases when I need fast results. It is also quite inaccurate so I don't really like to use this for personal work where standards are higher. You also need to increase the HS subdivs in order to get rid of unwanted blotches all over your scene.

My second was to put a Vray light plane in each and every window. It is the most commonly used method and it might be the best. We could either set every Vray light individually (due to the fact that even the diffuse light has an angle and the light flow is not supposed to be even in the entire room) or use them as skylight portals.

The third choice which I decided to use is a Vray dome with an HDRI for diffuse light and a Vray sun for the sunrays. This way I didn't have to bother putting Vray lights in every window and

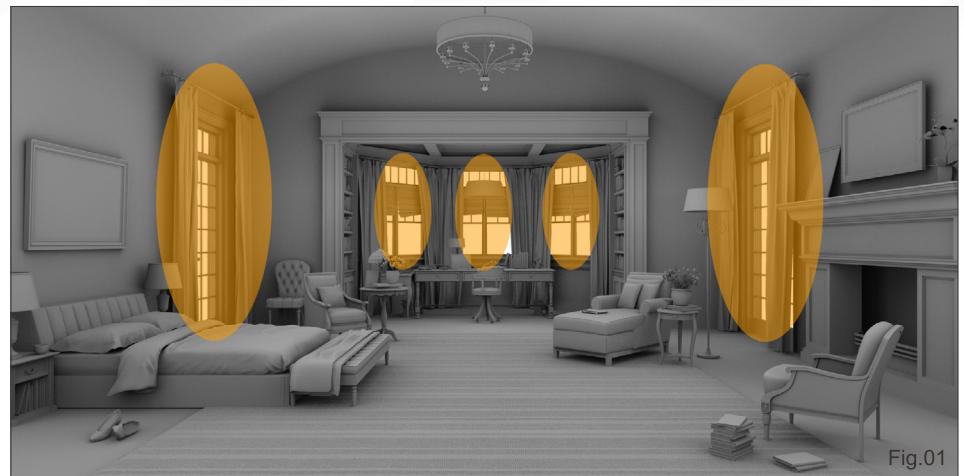


Fig.01



Fig.02

just used one light source for diffuse light. In this particular case the Vray planes might have been a better solution since the Vray dome light seems to render the longest out of all the above, but I recently used this method in a current personal project the Kumu Art Museum of Estonia and I thought I'd share how I did it. (Fig.02) As you can see on this render the main light is from above and with the shape of those sky lights it would have made it hard to put Vray planes in them. Also note with Vray planes we would have the problem of lightning the outside part of the wall. With a Vray dome there is no such problem.

So now we've decided to stick to this method we can create the Vray dome. Now we need to

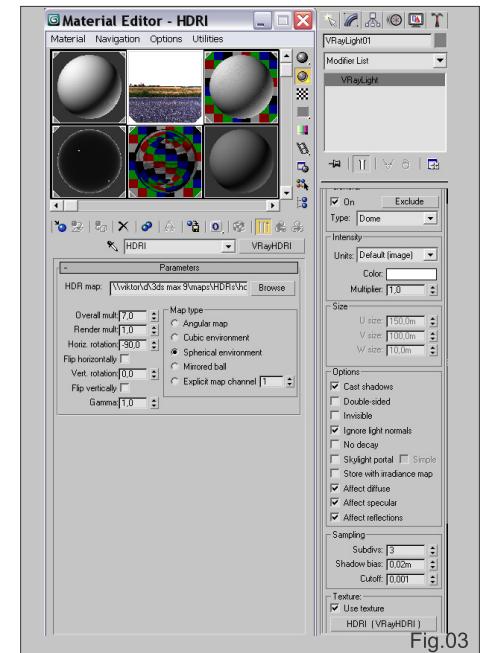


Fig.03

find the right HDRI. After a little research on the net I came one which I could download for free. It is just what I needed as it will give the scene a nice purple wash. The Vray domes multiplier should remain 1,0 since we will tune the HDRI's multiplier instead (Fig.03).

For the test renders we will use material override to reduce render times until we get it right. The scene will be white and brown which means we should use grey for the diffuse color not pure white, so after we apply all the materials to our scene we won't get a completely different result.

By using an HDRI we can make sure that the diffuse light will have an angle instead of being



Fig.04

even from all sides. But we have to make sure the horizontal rotation is set correctly so that the HDRIs sun will be at the same position as the Vray sun.

Let's run a test now (Fig.04). The scene is pretty dark, but it's not a problem. Note that the sun is not present yet and that the override color is grey, not white! Render presets are pretty low so far but for obvious reasons.

Now we need to set the sun. The position of the sun is pretty obvious: common sense would say we need long warm sunlight on the floor.



Fig.05

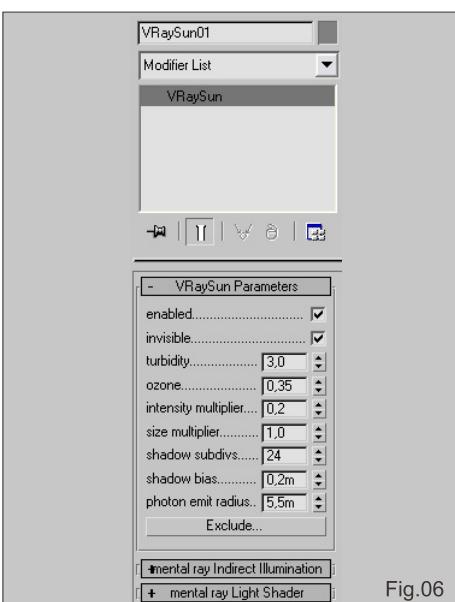


Fig.06



Fig.07

The position of the sun is more or less the only place to put it where the results will be the way we want them to be. Here are the light sources (Fig.05). And here are the parameters for our sun (Fig.06). Note that I am using a standard

camera not Vray physical camera that is why the intensity multiplier is so low.

Let's see our final test render (Fig.07). It looks pretty satisfying to me so after raising the render


**Fig.08**

quality and applying all the materials I finally rendered the scene (Fig.08).

And the rendering setup (Fig.09). I used Area filter and Adaptive DMC AA type.

After this comes the part I love the most: the post production. Unfortunately this is not part of this tutorial so it only gets a few words. I used Photoshop and After Effects for Color balancing, exposure control, vignetting, chromatic aberration, glow diffuse, soften edge, film grain, film effect, tonal contrast, depth of field. What I can give you as advice is to try to use them in a

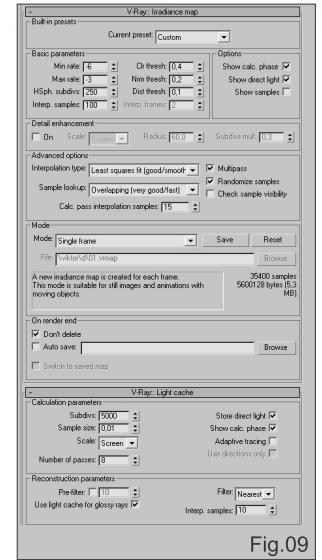
subtle way. Now days so many plugins appear on the market, everyone gets their hands on them, but I see many examples of people abusing them.

And the final result (Fig.10).

I hope this tutorial helps and that it will come in handy for everyone who reads it and come across an interior where there are various windows over the walls.

Next month will feature the same scene with broad daylight lightning.

Goodbye until then!


**Fig.09**

Tutorial by:

**VIKTOR FRETYÁN**

For more from this artist visit:

<http://radicjoe.cgsociety.org/gallery/>

Or contact them:

radicjoe@yahoo.com



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**Fig.10**



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## CHAPTER 1 | THIS ISSUE

Sunset / Sunrise

## CHAPTER 2 | NEXT ISSUE

Broad Daylight

## CHAPTER 3 | AUGUST ISSUE 060

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## CHAPTER 5 | OCTOBER ISSUE 062

TV-Lit (Night-Time) with Low-Level Lighting

## CHAPTER 1 - SUNSET/ SUNRISE

**Software Used:** Cinema 4D 11.5

### INTRODUCTION:

Hello and welcome to our new lighting tutorials. Maybe some words in general at first: The features used here are part of the Advanced Render 3 of the release 11.5. Some elements maybe could be reproduced in earlier versions of Cinema 4D, but in the earlier releases of Cinema 4D the global illumination feature is founded on completely different algorithms. So the results and settings might not fit in every way here.

The memory footprints for rendering this scene might be quite big so the usage of a 64 bit OS is recommended. The render performance is strongly dependant on the power of your hardware. So give yourself some time for rendering the final results, but I'm always trying to find a balanced setting between quality and render performance.

So let's start.

### RENDER SETTINGS

For the final rendering I used a width of 2000 pixels. This gives us a nice definition of small details which are part of this set. The anti-aliasing is set to "Best". For the work in progress

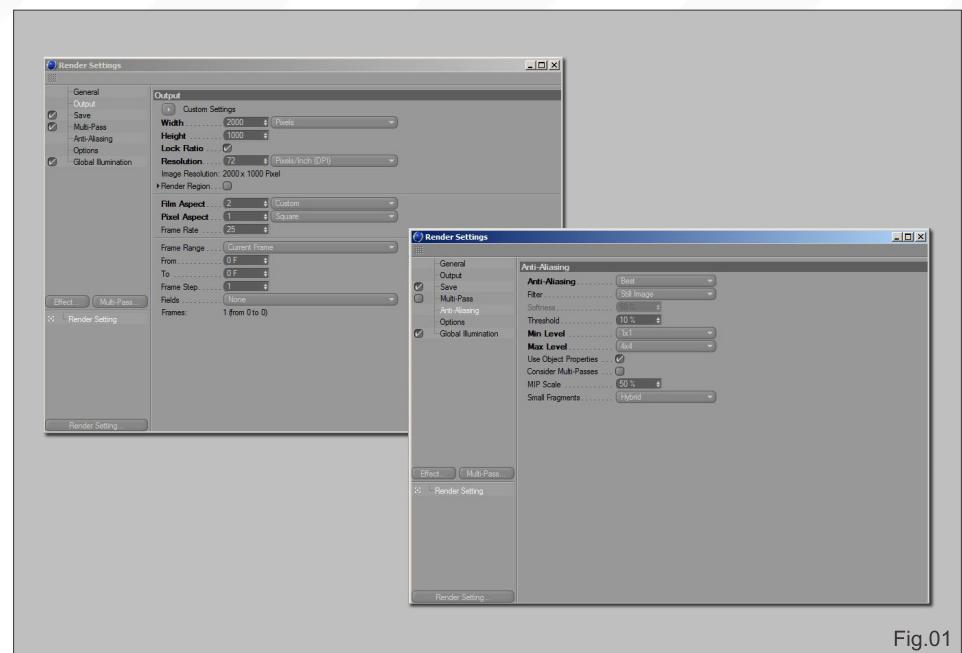


Fig.01

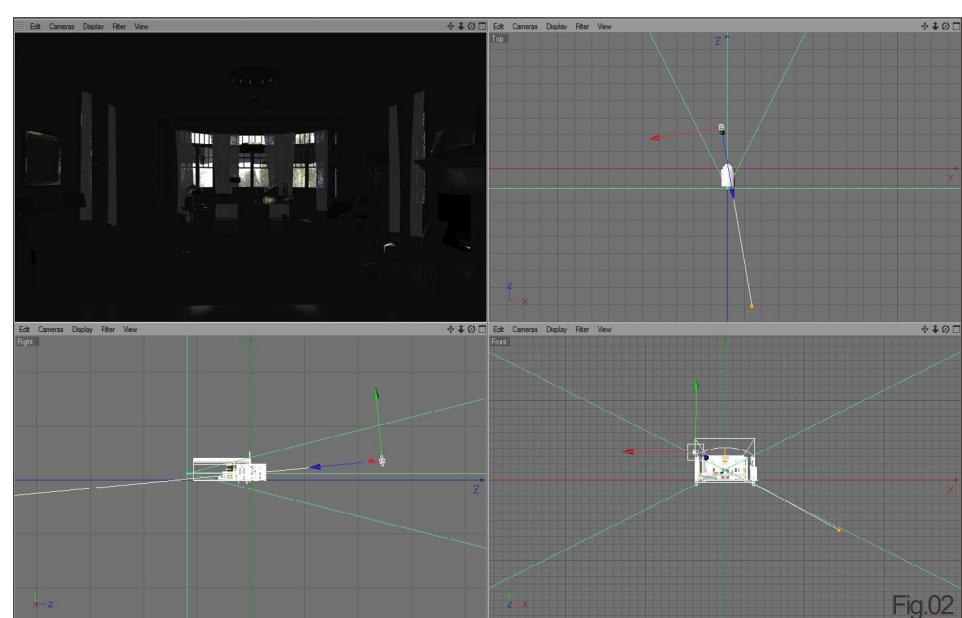


Fig.02

images you can also use "None" or "Geometry".  
(Fig.01)

In this kind of situation we always have a quiet warm color tone produced by the sun. The position of the sun is settled at a low altitude. The light is flowing over the surfaces and gives an interesting definition of the illuminated areas of our indoor scene.

For the setup of the lighting I use conventional light sources on one side, and global illumination on the other. So let's have a look at the structure of the setup...

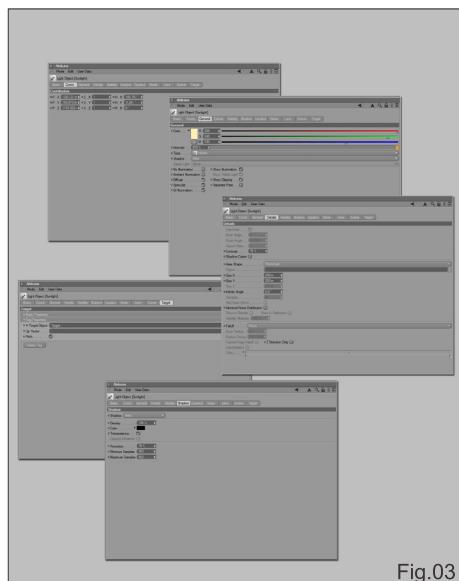


Fig.03

### SUNLIGHT

For this lighting two sun lights were used.

Looking at the editor screen it might appear that this light source might not produce any effect at all, but in combination with the global illumination it does work. The main key light is what I simply called "Sunlight". It has a very strong strength with a yellowish color. The contrast is quite high. During the making of this tutorial I tried different positions of the light sources. To do that in an easy way I used a target tag focused on a separate light target. (Fig.02 and Fig.03)

## SECONDARY SUNLIGHT

Yep, we have a second sun here, quite handy. This light source gives us the opportunity to get more light on the area that you can see in the editor shot. If we used only the primary sunlight for this, we would have to increase the sample levels to a much higher position. This would have a negative effect on the performance later. So this is a quiet handy and effective work around.

If you watch the positions of the two lights very closely, you might recognise a small difference, but don't worry about that. First of all you will not see any difference at the end. Secondly the control over the illuminated areas is better. And thirdly in natural light beams are filtered and influenced by objects like the leaves of the trees you can see in the background. The direction of the sunlight is not so focused any more. At the end we want to get a nice image...so let us use these little tricks. (Fig.04 - Fig.05)

## INDIRECT LIGHTS

When you look at the real world you might discover that light does not only affect objects from the direct position of the light source, but also from every other. Light beams are bounced on surfaces and reflected. Otherwise we would get this harsh light/dark effect we can see on space photographs. In the early days of CG this effect was very typical for raytraced images, so it had to be lowered with a lot of additional lights in order to get rid of it. Even now when using the global illumination feature we have to trick it, because in contrast to nature no computer or even render farm can handle an unlimited number of raytraced light beams.

In our case we can leave the sample settings on a reasonable level by using this indirect light. The other effect is that we can get more control of the modulation of illumination on the surfaces of the indoor scene. (Fig.05 – Fig.13)

In the case of Fig.12 and Fig.13 I used some exclusions, this is to limit the amount of light working on these objects.

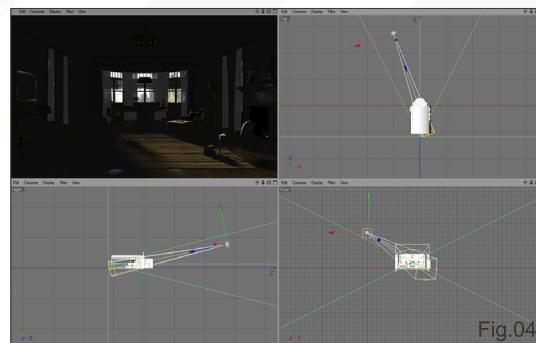


Fig.04

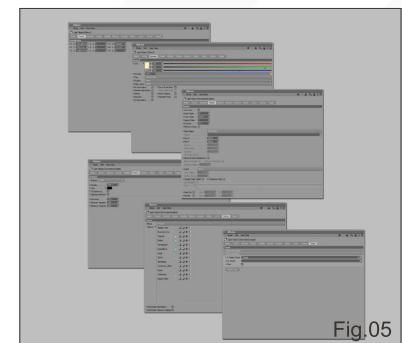


Fig.05

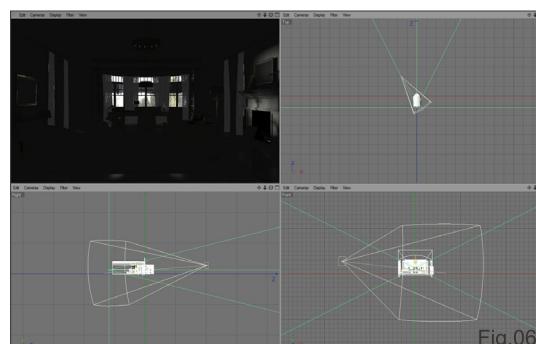


Fig.06

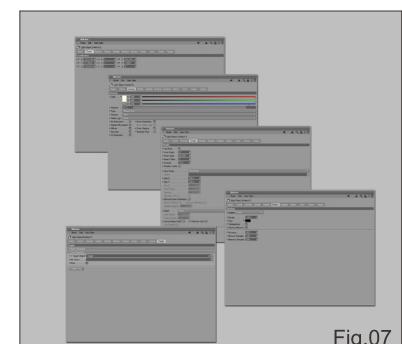


Fig.07

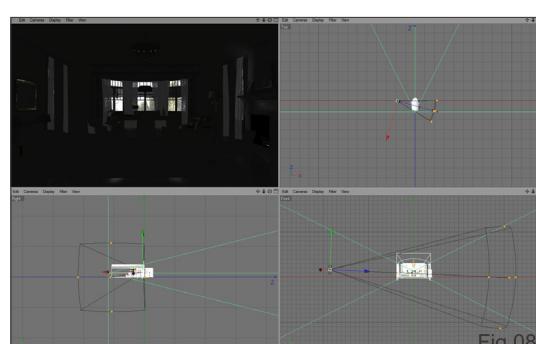


Fig.08

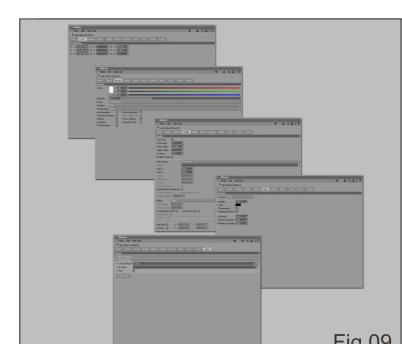


Fig.09

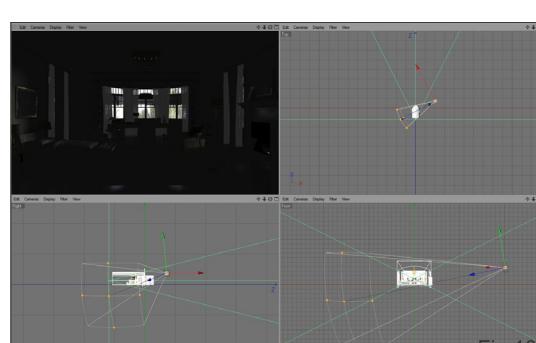


Fig.10

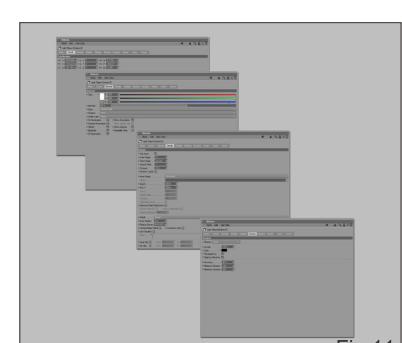


Fig.11

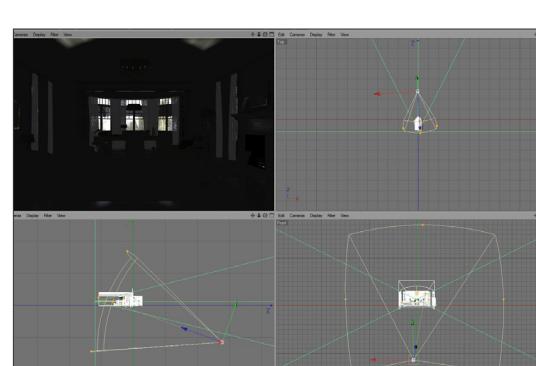


Fig.12

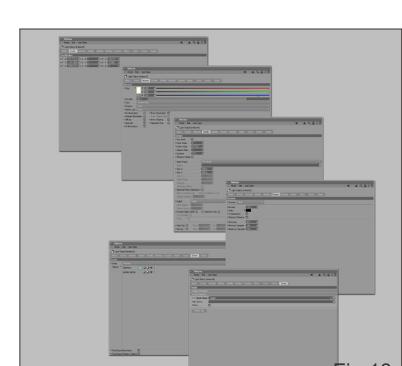


Fig.13



Fig.14

Now it is time to have a look what we have so far. (Fig.14)

## EFFECT LIGHTS

In order to get more definition on certain objects I used two other light sources. Again exclusions do a good job here. (Fig.15 - Fig.18)

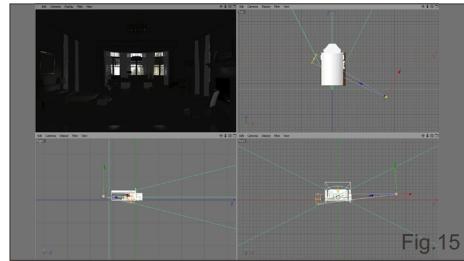


Fig.15

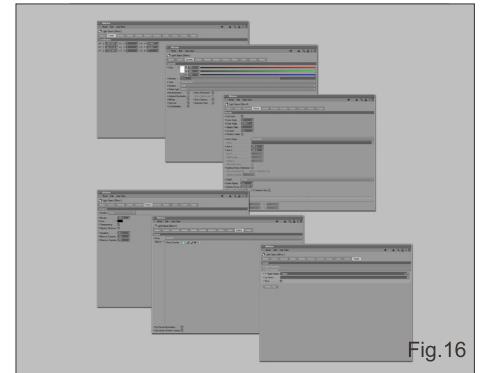


Fig.16

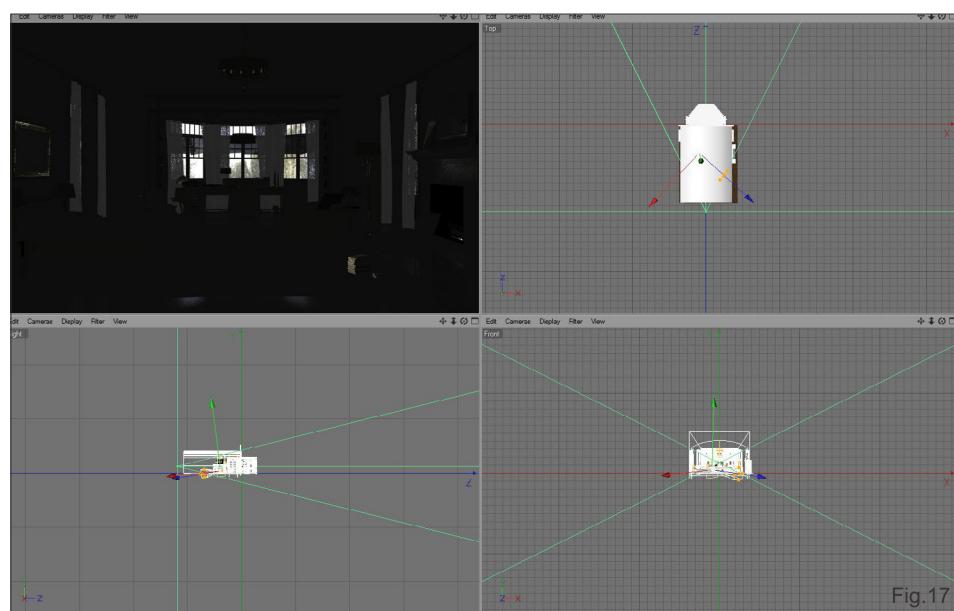


Fig.17

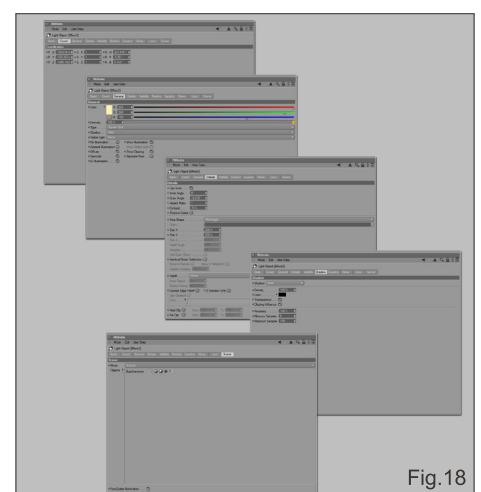


Fig.18



Fig.19

The results can be seen here. (Fig.19)

## REFLECTORS

Considering the fact that we want to use GI here, we have the possibility to define objects which I called "reflectors". I placed two next to the windows outside with a blueish color and one inside the room with a yellowish one. This helps us to simulate the light bounced from the walls. In Advanced Render 3 this kind of object with a luminance material can be defined as light sources. They produce a very smooth light. Using compositing tags prevents them from dropping shadows themselves, which we do not want in this case so the shadow dropping of the other lights is not influenced. (Fig.20 - Fig.21)

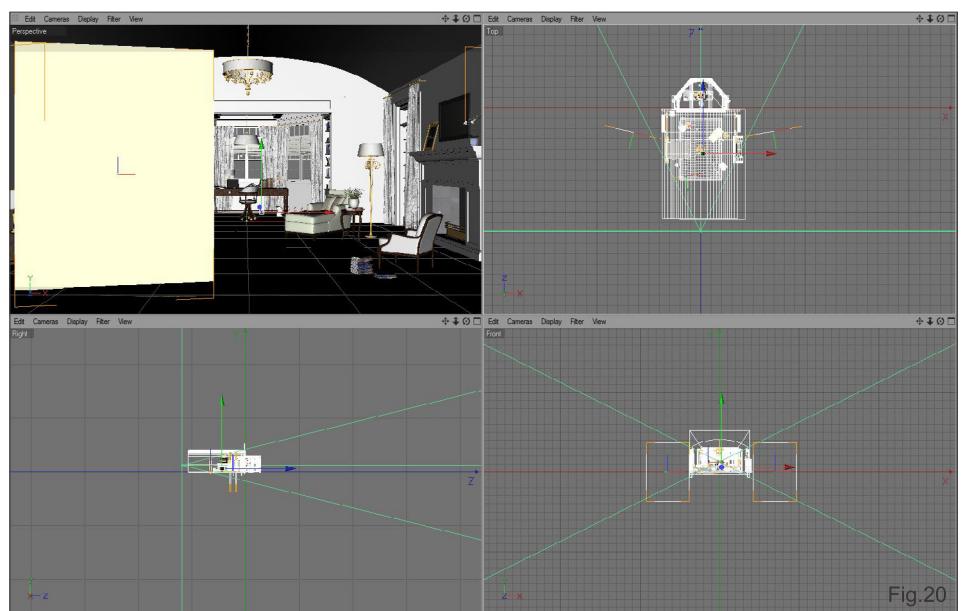


Fig.20

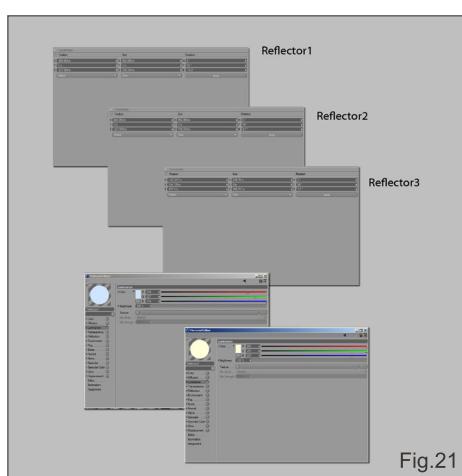


Fig.21

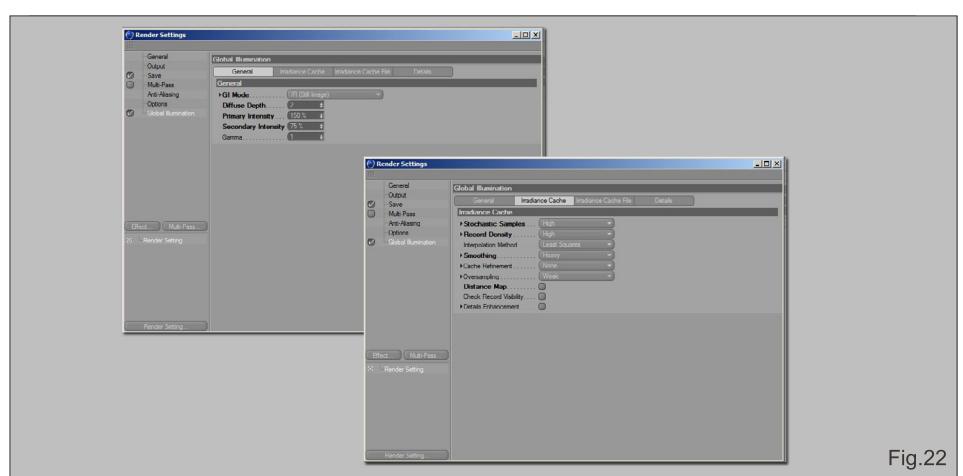


Fig.22

## GLOBAL ILLUMINATION

Now it is time to get the rest of the illumination using GI.

For a satisfying effect I use a diffuse depth of two with a primary intensity of 150% and a secondary of 75 %. The final quality settings are at a higher level in order to prevent any artifacts on the smooth surfaces of the walls. For a quicker preview you can set them to preview level. The render using these parameters shows that we have a large amount of render artifacts here, but it is a handy feature to get an impression of the final rendering. (Fig.22 - Fig.23)



Fig.23



Fig.24



Fig.25

## FINAL RENDERING

The final image was edited in Photoshop for fine tuning. The multi pass option delivers channels like the depth channel and the reflection pass separately. This was the two extra channels which I used for the final render. As I said before: it takes some time to get a good render. So the best thing to do is to leave your computer working over night. If you experience problems with the performance of your machine, you can try to lower the resolution of the render, or to reduce the quality settings for the GI.

So have fun and good bye for now, Fredi.

(Fig.24 - Fig.26)

Tutorial by:

**FREDI VOSS**

For more from this artist visit:

<http://fredivoss.cgsoociety.org/gallery/>

Or contact them:

[vuuxx@gmx.de](mailto:vuuxx@gmx.de)



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Fig.26



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## CHAPTER 1 | THIS ISSUE

Sunset / Sunrise

## CHAPTER 2 | NEXT ISSUE

Broad Daylight

## CHAPTER 3 | AUGUST ISSUE 060

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## CHAPTER 5 | OCTOBER ISSUE 062

TV-Lit (Night-Time) with Low-Level Lighting

## CHAPTER 1 - SUNSET/ SUNRISE

Software Used: Maya

### INTRODUCTION:

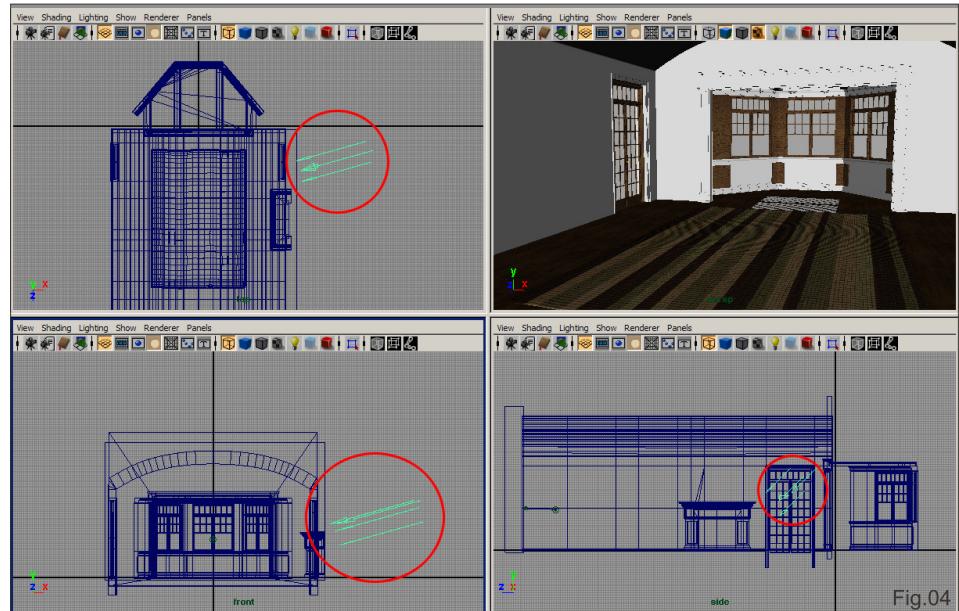
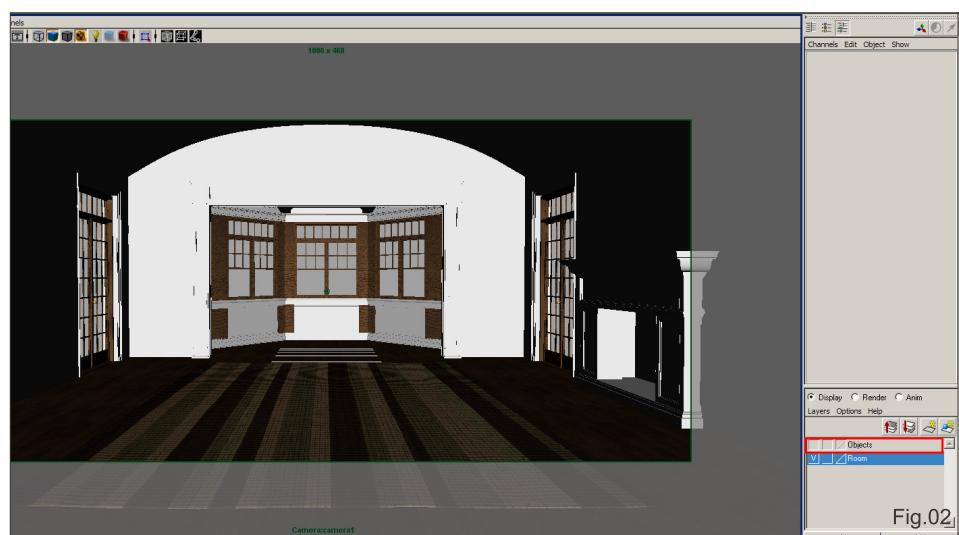
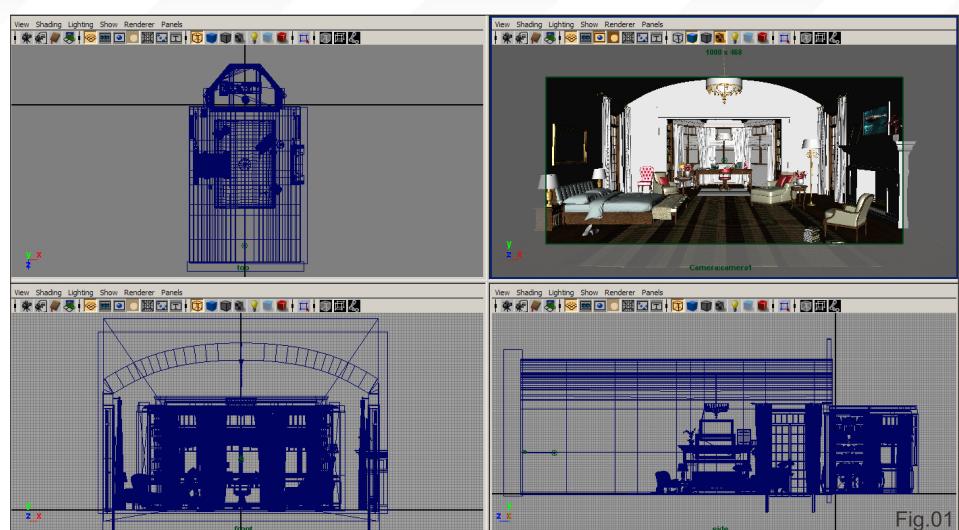
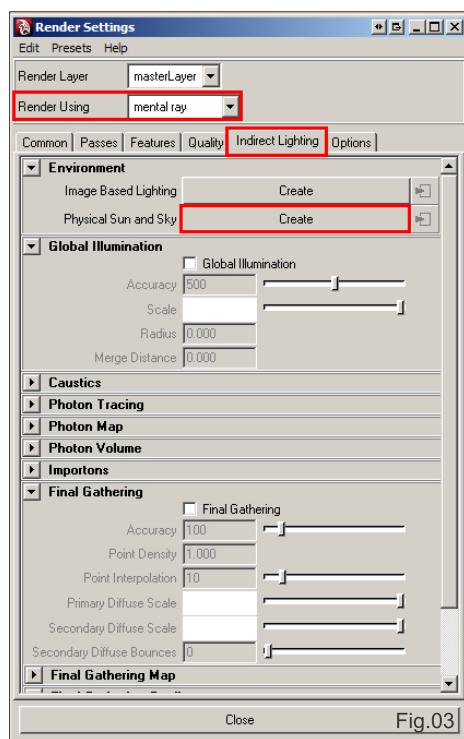
Welcome to this new lighting tutorial series. This time we'll be covering interior lighting in different situations. In this first part we'll create a sunset lighting rig for our interior scene.

Open the scene file and let's have a look at what we have. (Fig.01)

This is quite a complex scene, with a lot of detailed objects and materials. The scene has been divided into two main layers (Room and Objects). (Fig.02)

We'll start working on the lighting having only the Room layer active. To hide the Object layer, just uncheck the layer as shown in Fig.02.

We'll be using mental ray's Physical Sun and Sky. So open the Render Settings panel and make sure that mental ray is selected in the Render Using menu. Switch to the Indirect Lighting tab and click on the Create button next to Physical Sun and Sky. (Fig.03)



A new direct light will be created at the origin of the scene. This will be our main light source (the sun). Since this is a large scene, you may have

to manually select the direct light and scale it up to better see and select it easily. Scale the light and position it like shown. (Fig.04)

Now, with the light still selected, go to the Panels menu in one of the viewports and select Look through Selected. This way we'll be seeing the scene from the light's point of view. This will come in handy to correctly position and rotate the light to get the lighting situation we're after (Fig.05).

In (Fig.06) you can see the light's position and rotation used for the final image of this tutorial. The spots marked in red define the areas where the light will be passing through and thus illuminate the room.

Before rendering the scene, open the Render Settings and switch to the Quality tab. In the Frame buffer section, set the Gamma value to 0.454. (Fig.07)

Render the scene to see what's happening with the light. (Fig.08)

As you can see, we have our main light source (the sun) passing through the windows and casting shadows into the room. Don't worry about the dark spots all over the image we'll take care of that later.

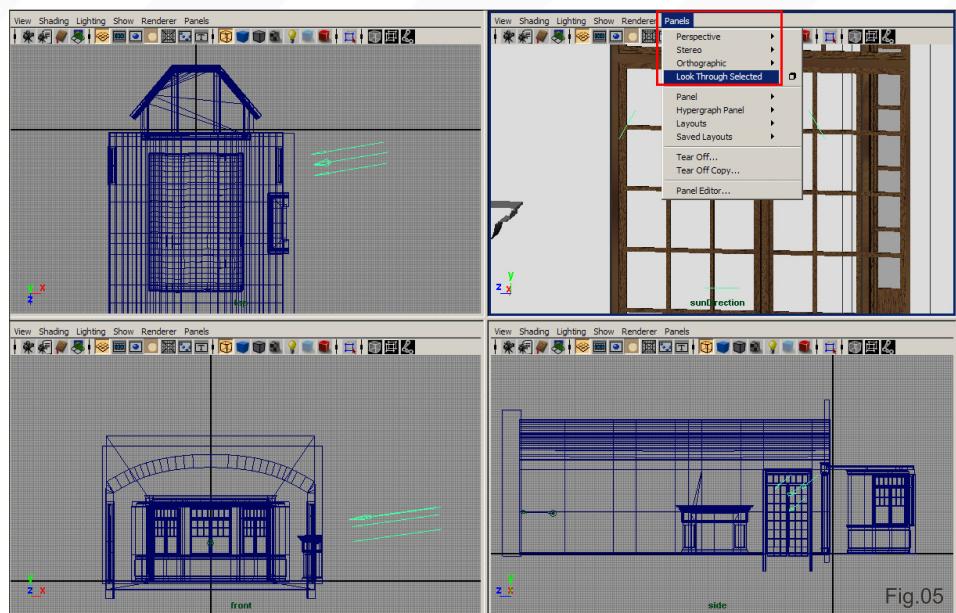


Fig.05

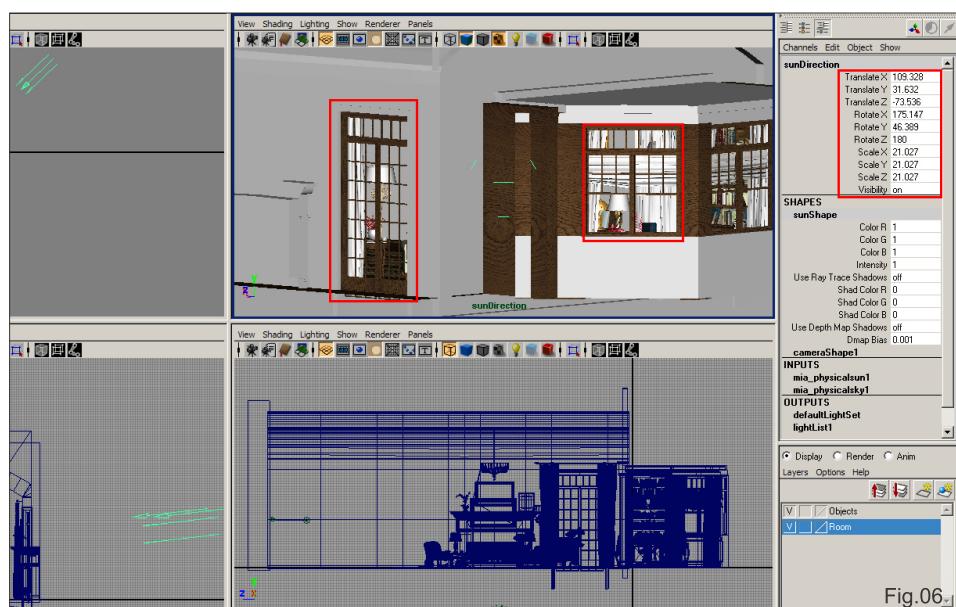


Fig.06

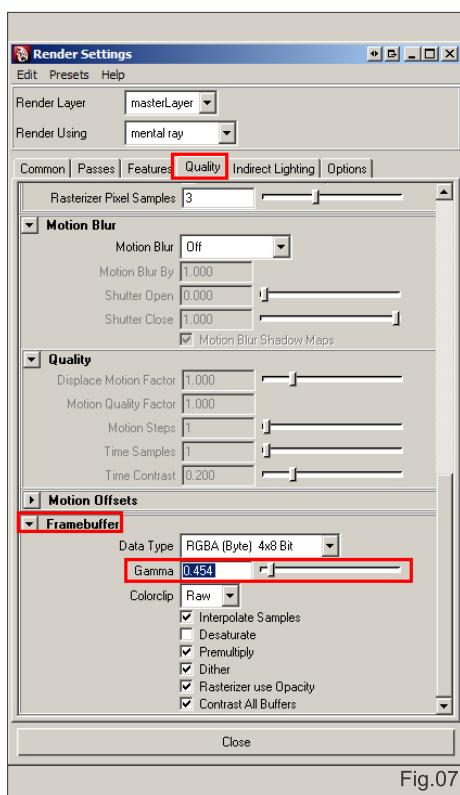


Fig.07

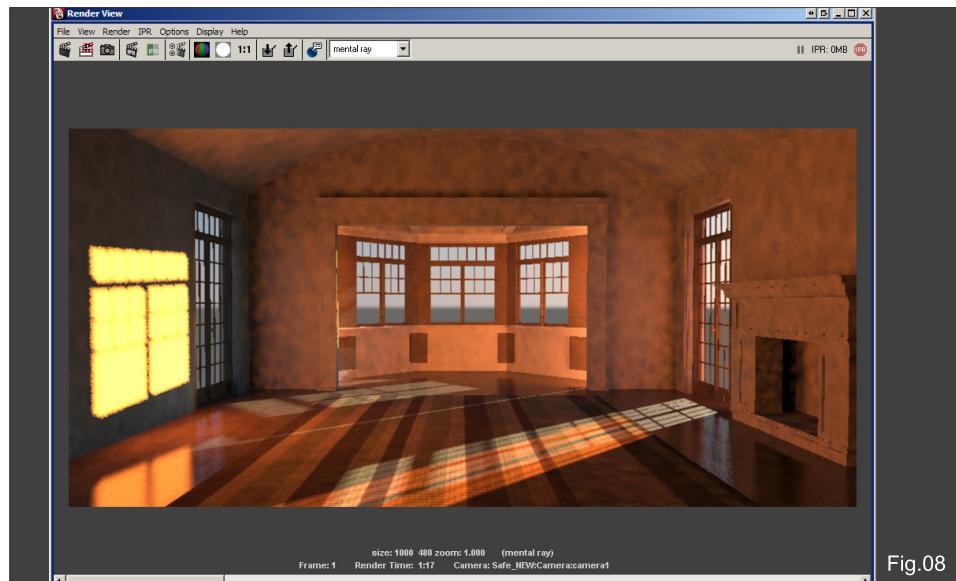
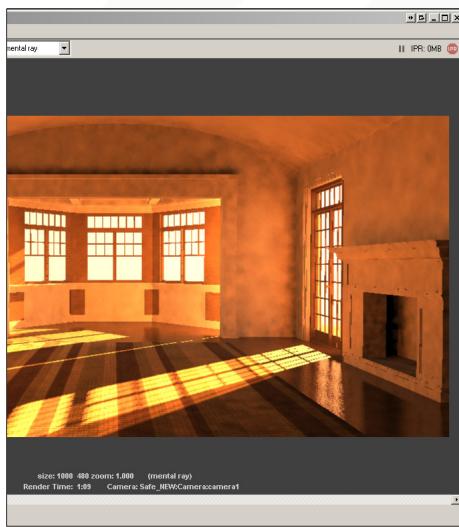
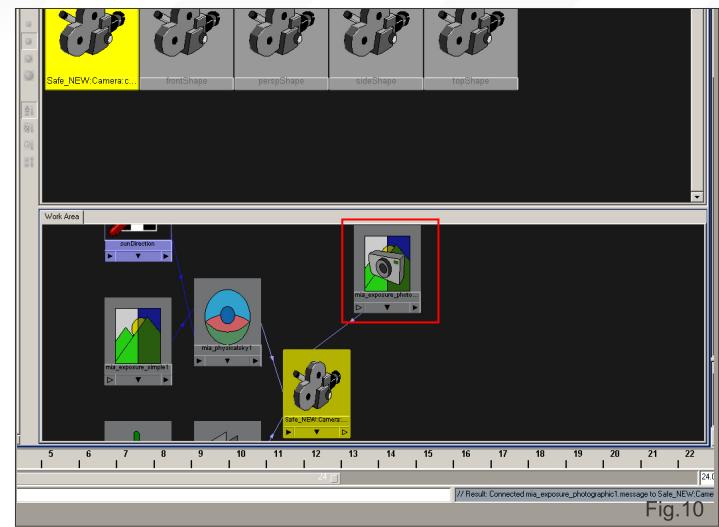
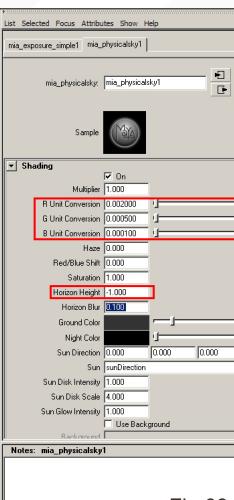


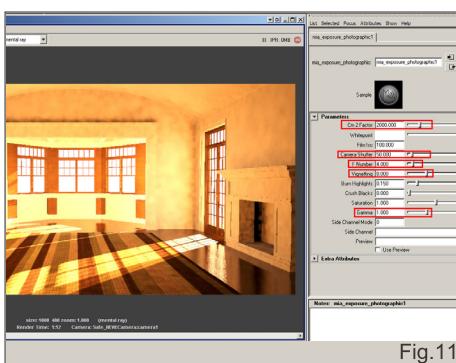
Fig.08


**Fig.09**

**Fig.10**

The sky outside is still too cold, so let's change some values for the Physical Sky.

Select the camera and find the mia\_physicalsky node. Change the settings as shown in **Fig.09**.

Set the R Unit Conversion value to a higher value, since we need more warm and reddish colors for our sky. Also, set the Horizon Height value to -1. (Fig.09)

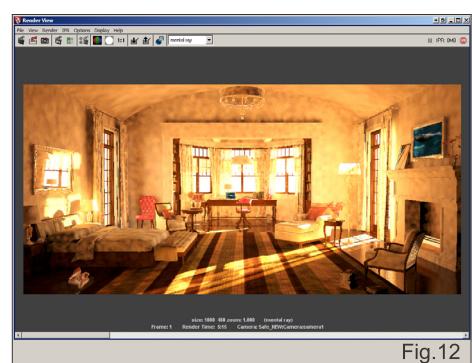

**Fig.11**

Now we need a better control over the exposure of the image. Open the Hypershade and select the camera in the graph. Create a new mia\_exposure\_photographic node and connect it to the camera node (drag it with the middle mouse button over the camera node and choose default for the connection). The mia\_exposure\_photographic node can be found in the mental ray nodes (Lenses section). (Fig.10)

If you render the picture now, you'll probably get a full black image. That's because we need to change the mia\_exposure\_photographic

settings to better fit with our scene size. First of all, change the Cm 2 Factor value to about 2.000. Then change the Camera Shutter value to 50 and the F Number to 4. You can also add a vignetting effect increasing the Vignetting value. Don't forget to set the Gamma value to 1. (Fig.11)

Take your time and play around with the values in the mia\_exposure\_photographic node. You can achieve really nice and realistic effects. For example, you can try to play with the Burn Highlights and Crash Black values, to get the right "mood" for your picture. If you need to get

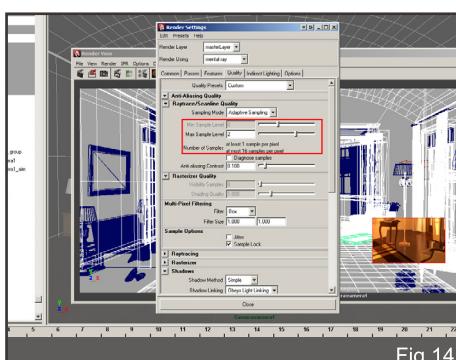

**Fig.12**

a brighter picture, change the F Number and Camera Shutter values.

Once you are happy with your settings, unhide the Objects layer and try to do some test renderings. You may need to change the mia\_exposure\_photographic values accordingly. (Fig.12)

When you are happy with the result, you can move on and prepare Maya for the final rendering. This is a trial and error phase, just try to raise the overall quality of the rendering without having unaffordable render times.

Raise the Accuracy value in the Final Gathering section and play with the Point Density and Point Interpolation values until the dark spots go away. (Fig.13)


**Fig.14**

Also, don't forget to set the antialiasing values to have a sharper image and enhance the details. Open the Render Settings and switch to the Quality tab. Change the Max Sample Level to about 2. (Fig.14)

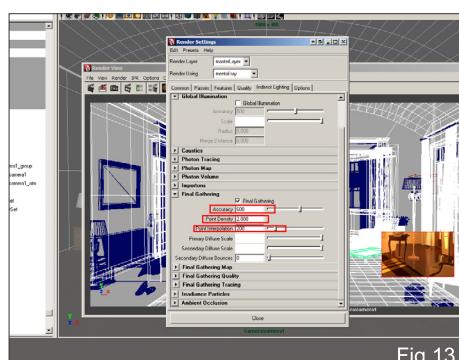

**Fig.13**



Fig.15

In Fig.15 you can see the final rendering used for this tutorial. Don't forget to save the final rendering with the alpha channel (just use the TIF or TGA file formats), as we'll need it later in Photoshop.

Now we need an Ambient Occlusion pass for compositing purposes. Create a new Render Layer and call it AO or something like that. Assign all the geometry to this layer (select all the objects then right click on the AO render layer and assign them). (Fig.16)

Open the Hypershade and create a new Surface Shader material. Create a new mib\_amb\_occlusion node and connect it to the Out Color of the Surface Shader. Select the mib\_amb\_occlusion node and change its settings like shown in Fig.17.

Render the AO render layer and save the picture. (Fig.18)

Open both the color and AO pictures in Photoshop. Copy the AO layer and paste it over the color one. Set the blending mode for the AO layer to Multiply and change the Opacity value as desired. Use a layer mask or a soft brush to slightly remove the AO over the spots marked in red in Fig.19 (the windows).



Fig.18

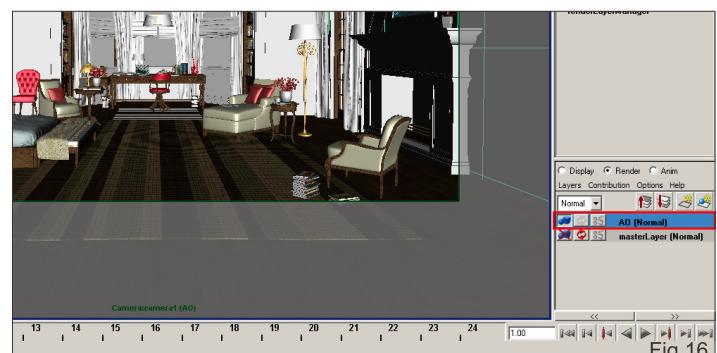


Fig.16

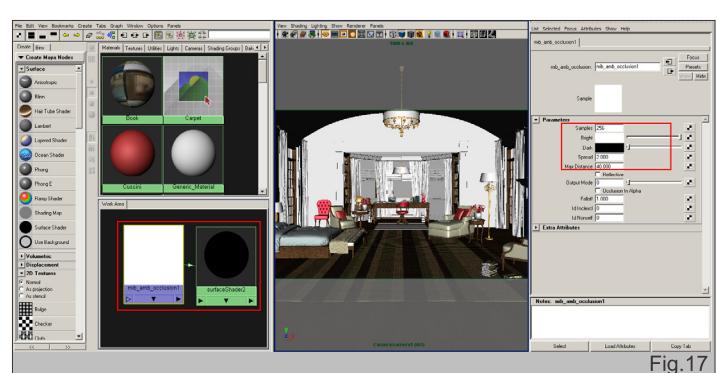


Fig.17

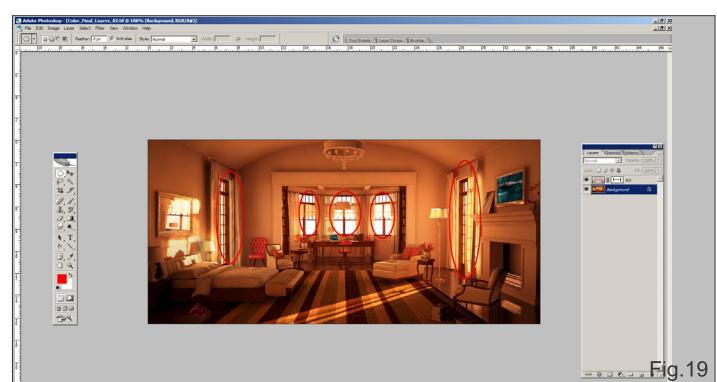


Fig.19

Find a nice sunset sky picture and paste it over the other layers (**Fig.20**).

Select the Alpha Channel and delete the selected part of the picture. (**Fig.21**)

Duplicate this new layer and assign a new Layer Style (Outer Glow) to it. Copy the values shown in **Fig.22**.

Try to play around with the exposure control and the Hue/Saturation tool to get the desired look for your final picture. (**Fig.23**)

Tutorial by:

**LUCIANO IURINO**

For more from this artist visit:

<http://www.pmstudios.it>

Or contact them:

iuri@pmstudios.it

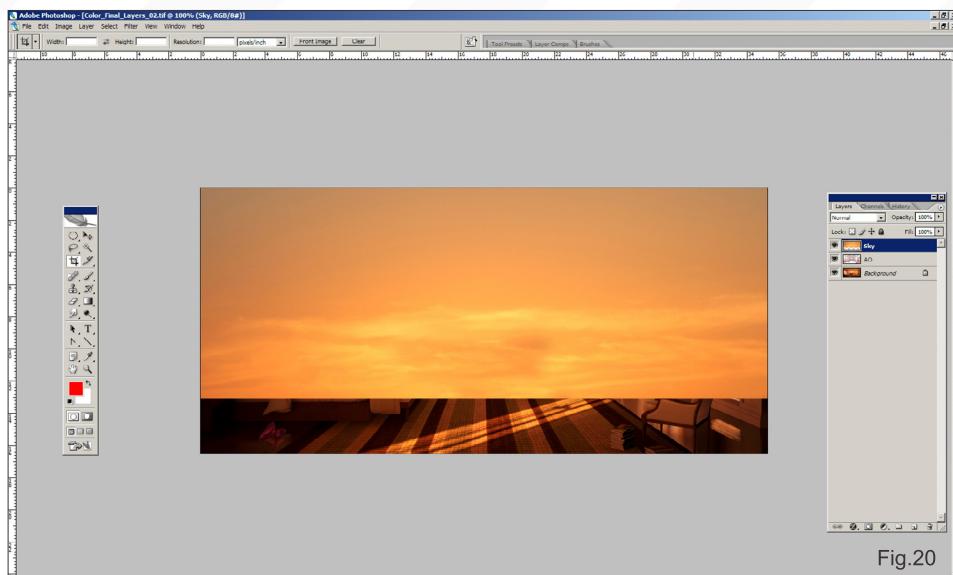


Fig.20

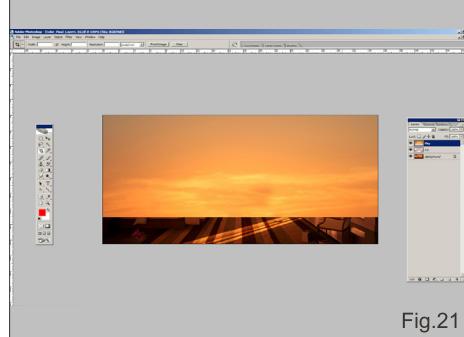


Fig.21

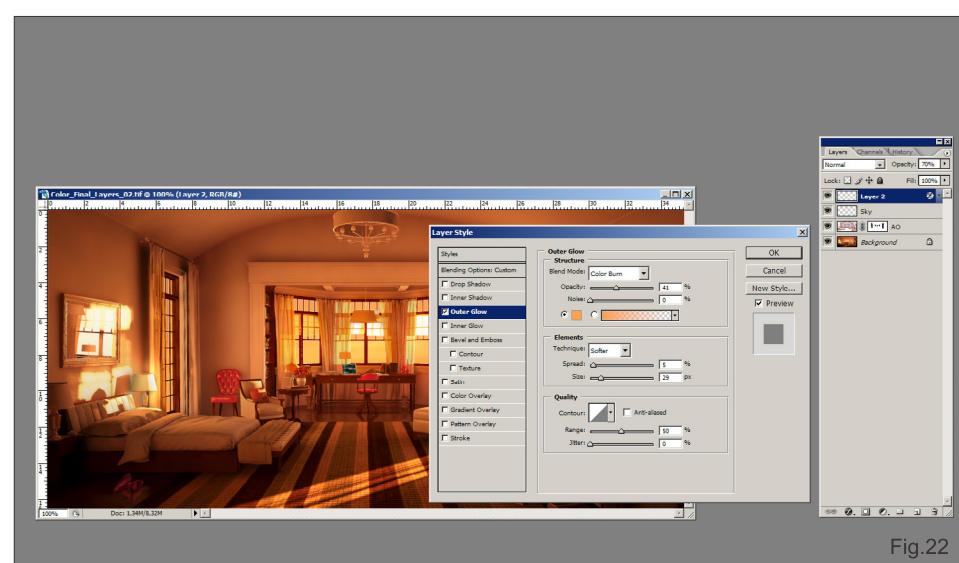


Fig.22

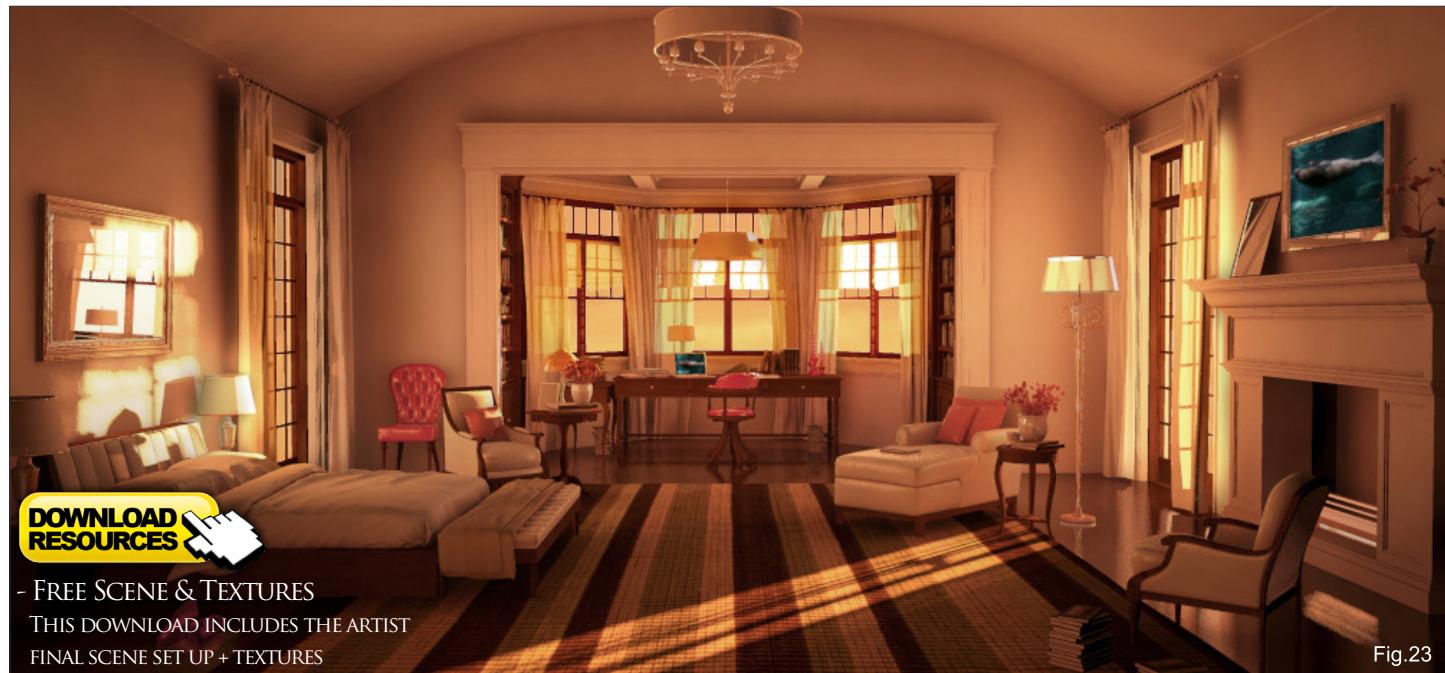


Fig.23

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Editor &amp; Content Manager &gt; Simon Morse

[simon@3dtotal.com](mailto:simon@3dtotal.com)

Lead Designer &gt; Chris Perrins

[chrisp@3dtotal.com](mailto:chrisp@3dtotal.com)

Marketing &gt; Claire Hughes

[claire@3dtotal.com](mailto:claire@3dtotal.com)**PARTNERS**

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